Macworld

06.2001

PUT OLD MACS BACK TO WORK

Find a New Job for That Old Performa or Power Mac, page 42

Mac OS X upgrade or not

REVIEWED

Power Mac G4/733
The Fastest Mac Ever

New CD-Burning iMacs
500MHz and 600MHz Music Masters

iTunes 1.1
Apple's Free MP3 Player and Burner

Presentation Powerhouses
8 Conference-Room Projectors Tested

- SPEED TEST: OS X VS. OS 9
- SOFTWARE COMPATIBILITY
- THE NEW INTERFACE
- CAN YOUR MAC HANDLE IT?

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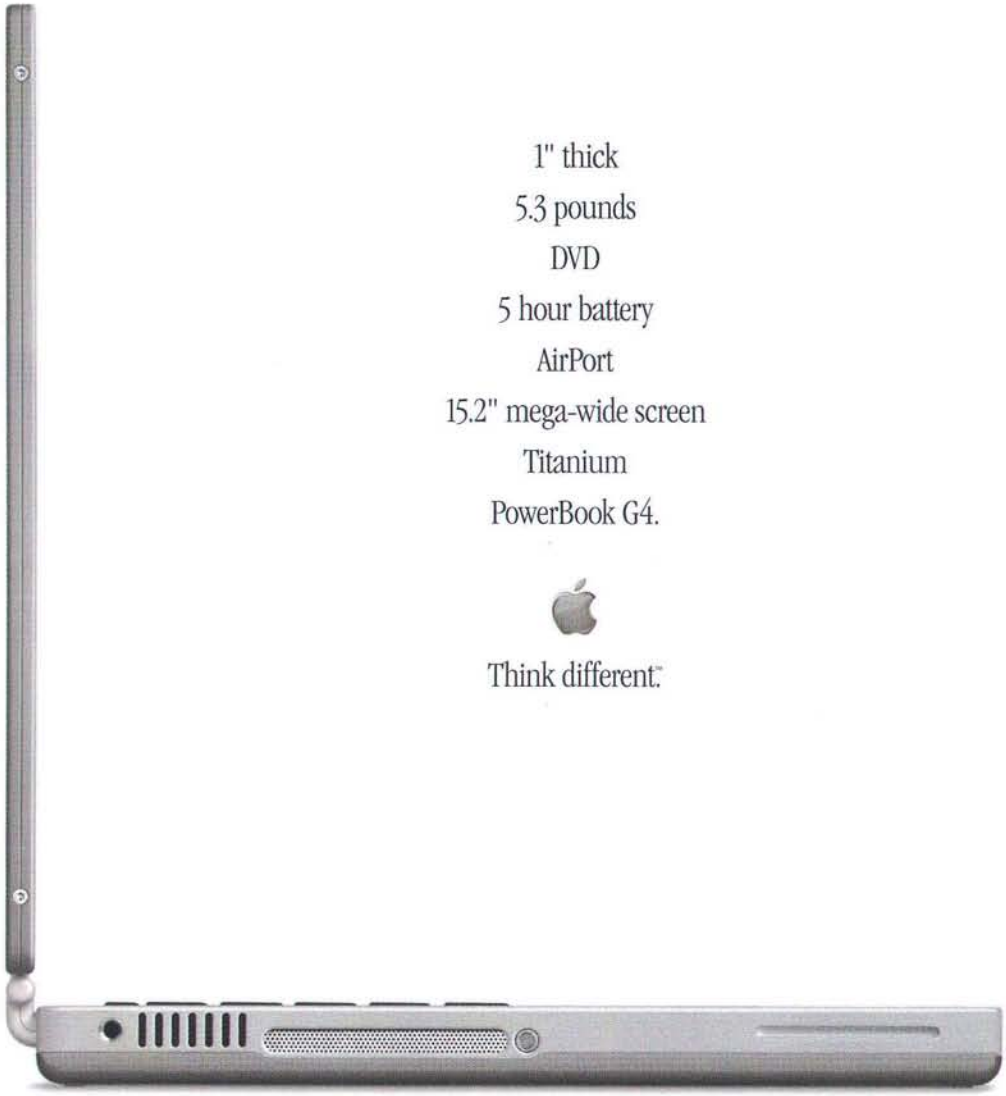

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Titanium

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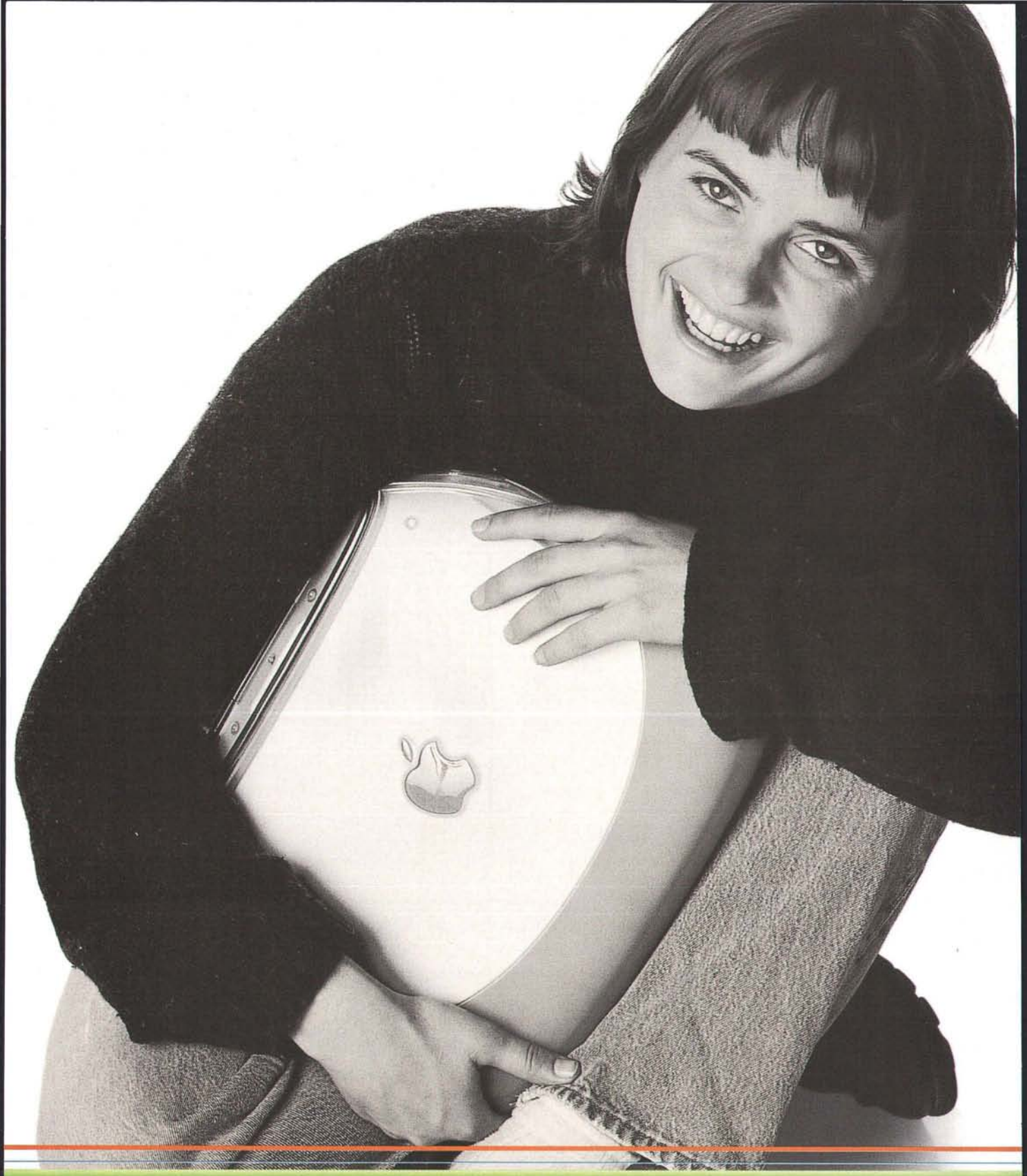

Jodie
world traveler

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Incorporating MacUser

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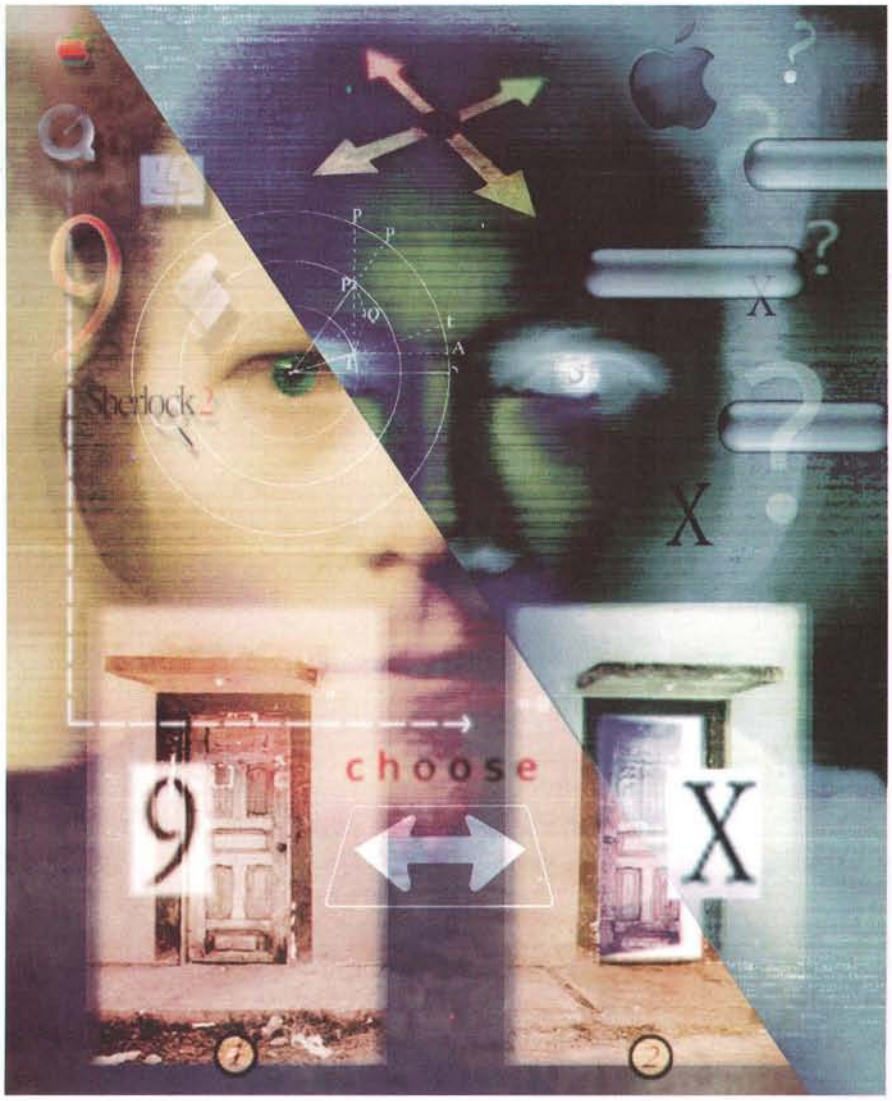

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HENRY BORTMAN Mac OS X has shipped at last, but are you ready to make the change? Macworld Lab and Henry Bortman examine your options—and the consequences of making the move now.

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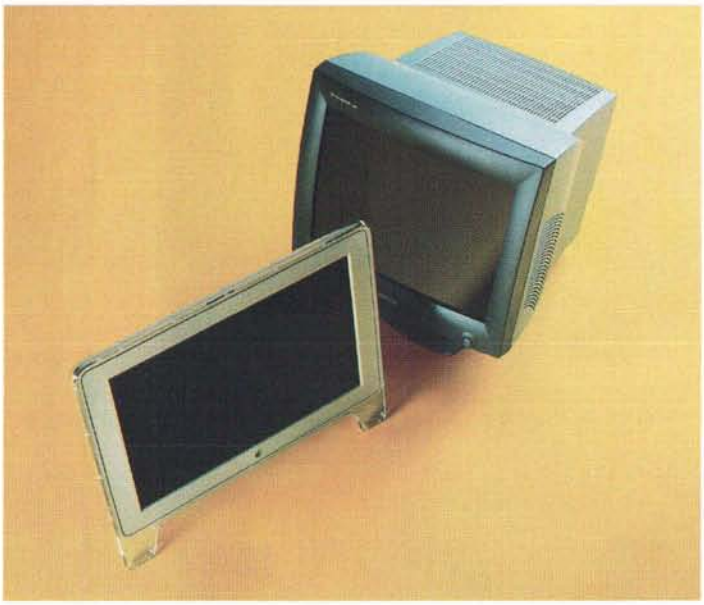

The Color Challenge
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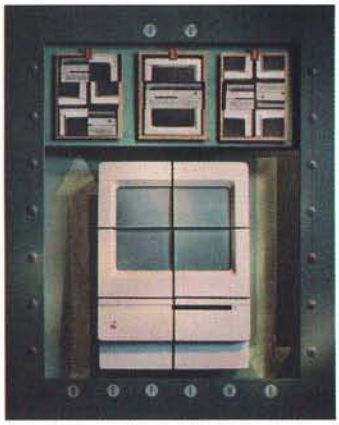

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- ♦♦♦♦ Who's There Firewall Advisor 1.0

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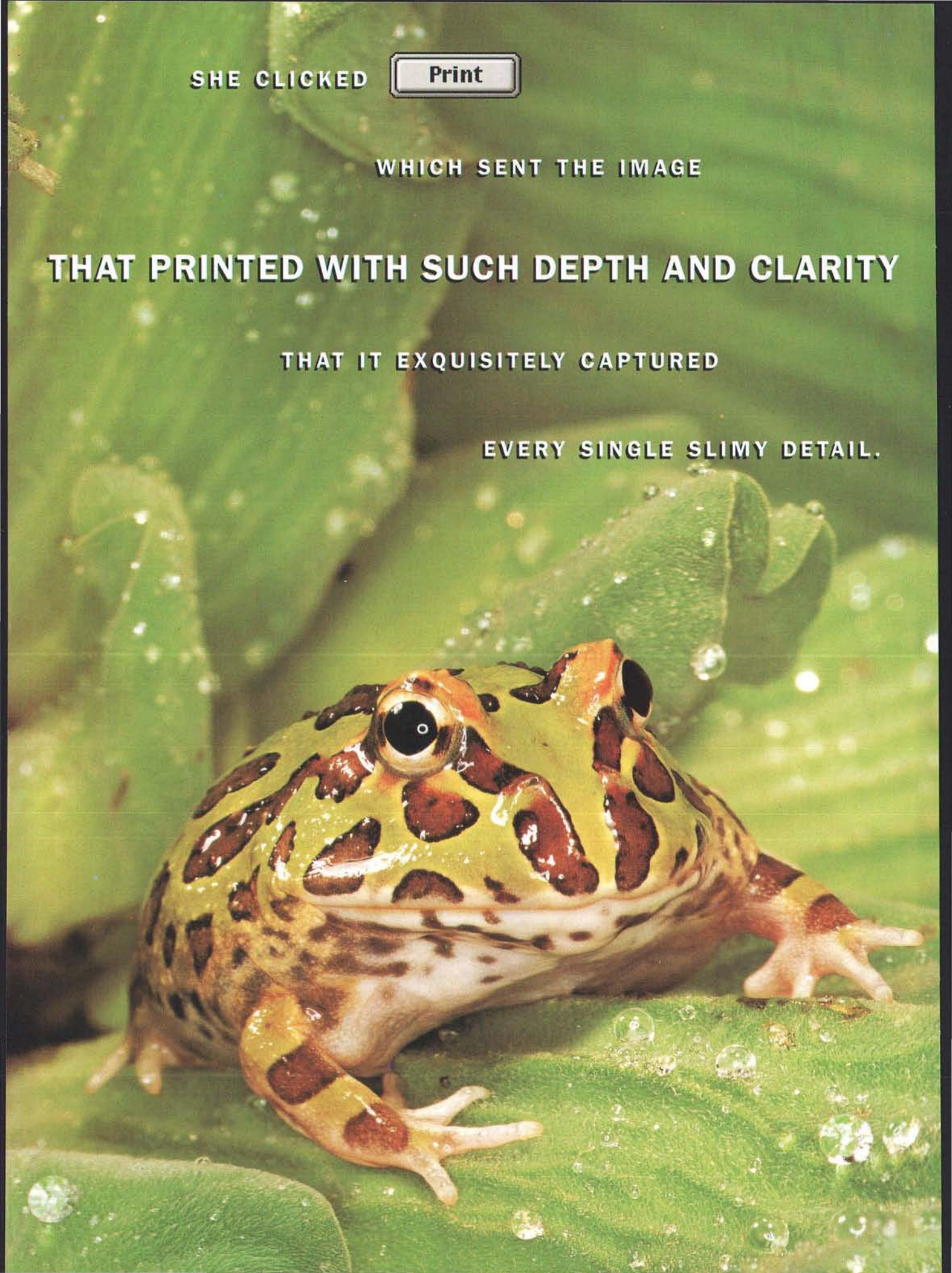
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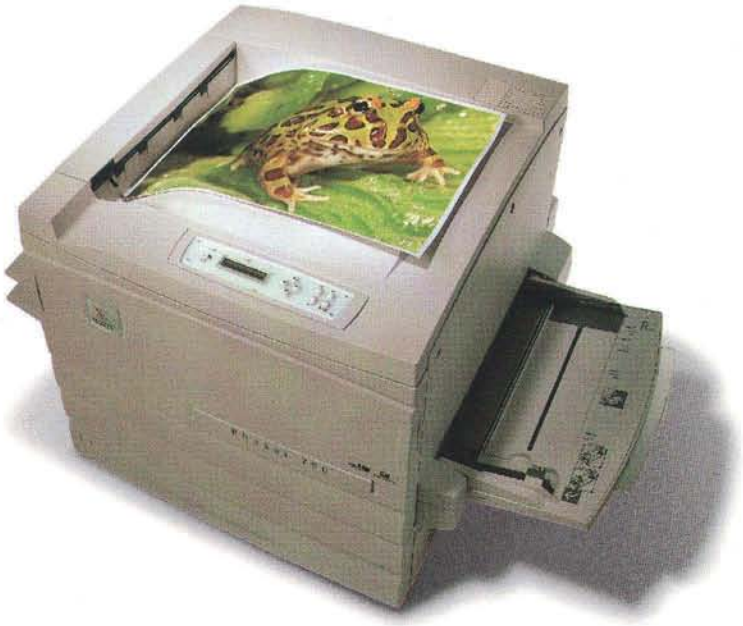

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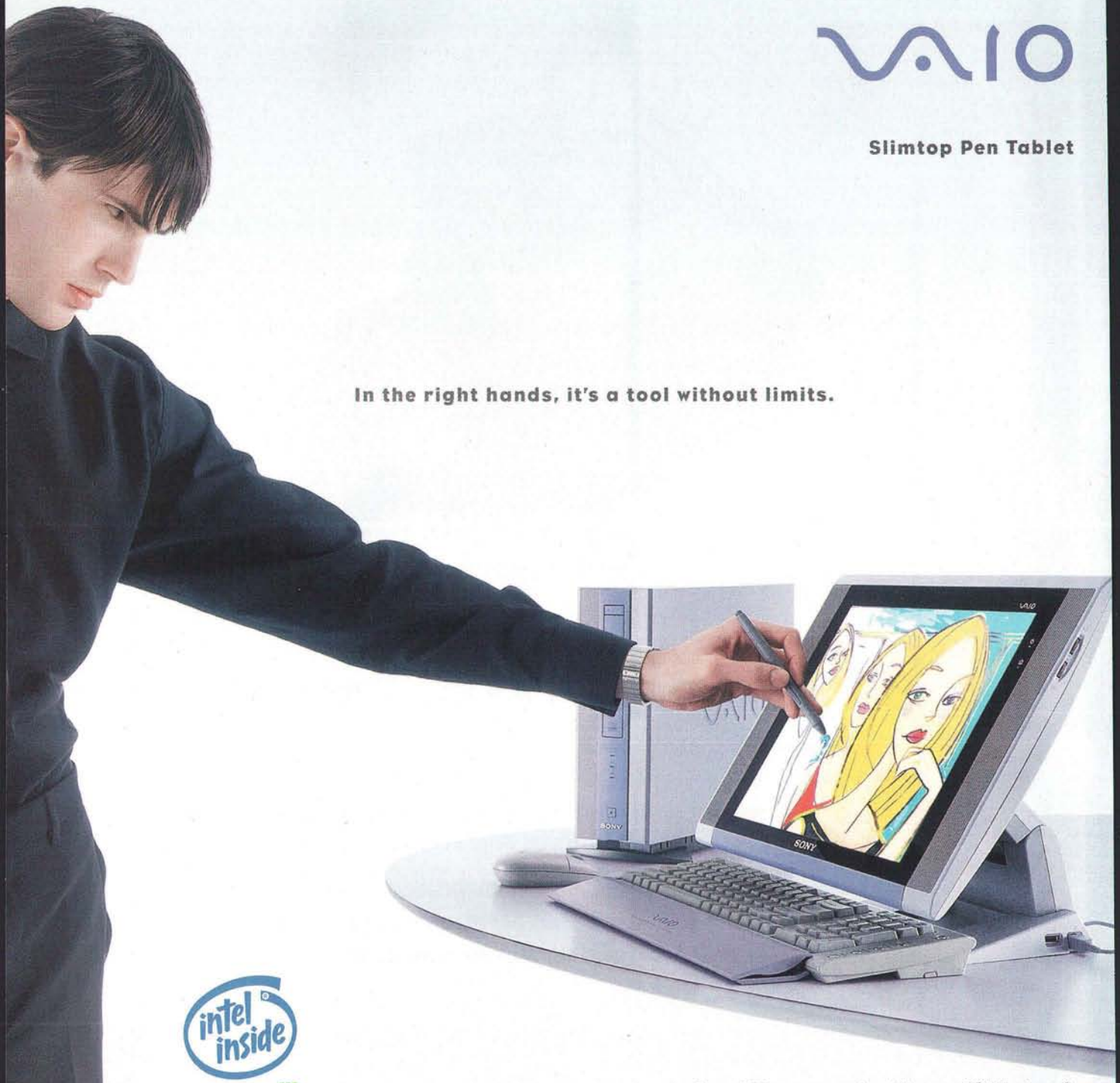

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ANDREW GORE

Brave New Macintosh

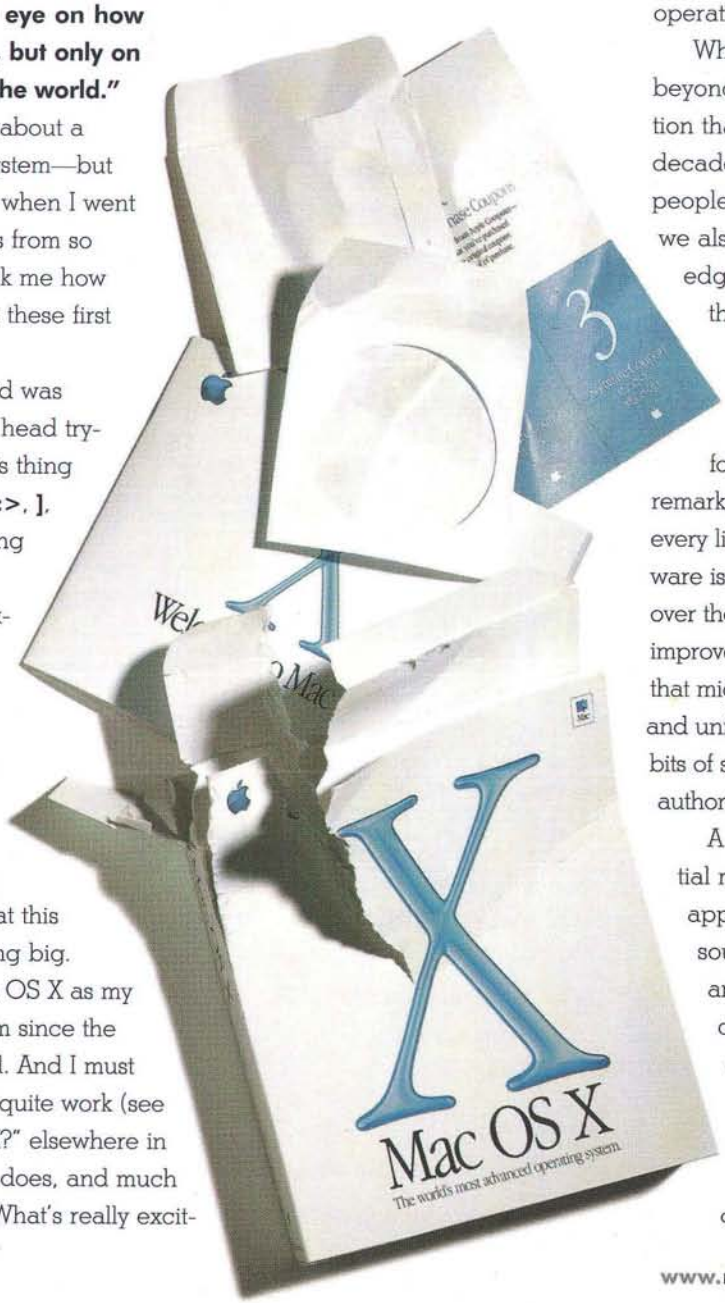
GET READY: MAC OS X IS THE START OF SOMETHING BIG

"When looking at this new operating system, you must look beyond the interface. Yes, it's new, it's different, maybe even a bit bizarre and inscrutable at times. But that's not what's really important here. What's important is that we have a totally new OS, and it feels like it. It's like a pristine canvas, waiting for someone to paint a masterpiece upon it. It's fresh, it's new, and it practically crackles with the electric potential of a hundred brilliant programmers frantically creating its future, with no eye on how they can make a buck, but only on how they can change the world."

I wrote these words about a new Apple operating system—but in 1984, not 2001. And when I went back to look at my notes from so many years ago, it struck me how true those words ring in these first days of Mac OS X.

At the time, the world was scratching its collective head trying to make sense of this thing called Macintosh. No **C:>**, **]**, or **READY.** prompts? Using pictures to issue commands? Built-in networking? A mouse? Only a handful of people recognized the Mac OS's potential at first. But as each upstart programmer made another little contribution to the platform, it was clear that this was the start of something big.

I've been using Mac OS X as my primary operating system since the night it officially shipped. And I must say, a lot of stuff doesn't quite work (see "Are You Ready for OS X?" elsewhere in this issue). But a lot of it does, and much better than I expected. What's really exciting is that I'm clearly at the start of something big *again*.



The old Mac OS, for all its steadfast functionality, ran out of headroom long ago. But Mac OS X is only at the beginning. Apple has successfully delivered Unix, the most powerful operating system in the world, to the desktop in a form most anyone can use. When you use it, you can feel the wellspring of power just waiting to be tapped.

Open Source

Steve Jobs himself said it, and I agree: By the end of 2001, Apple will be the largest source of Unix operating systems in the world.

Why is this important? Well, beyond inheriting an OS foundation that has been pounded on for decades by the most demanding people ever to torment a computer, we also benefit from all the knowledge about that foundation and the software written for it.

And, we get to take advantage of the massive open-source community for Unix. Open source is a remarkable concept. It means that every line of code powering the software is open to everyone. People all over the world can collaborate to improve that software, to expose bugs that might otherwise remain hidden and unfixed for years, and to re-use bits of software in ways that the authors might never have imagined.

A great example of the potential results is Fire, a universal chat application that uses open-source components to build an application that itself is not open source. By combining a variety of open-source codes written to interact with many popular—but incompatible—chat sys-

continues

tems (including those from Yahoo and MSN), software developer Epicware (www.epicware.com) came up with a program that uniquely integrates all these systems into a single, Mac OS X–only shareware application. Had Epicware been forced to write the code to interact with each chat system, Fire might never have been compiled.

The Mac, traditionally the most closed of closed environments, is suddenly wide open, thanks to Mac OS X's Unix foundation. The potential of a Mac OS capable of leveraging vast storehouses of brilliant open-source code is mind boggling.

Cocoa and Carbon

Another thing that has become clear to me is the power of Cocoa, an object-oriented framework for developing OS X–only applications. Traditional Mac developers seem to be struggling to move enormous old-OS programs to OS X using Apple's Carbon programming interface. But developers who have chosen to start fresh with Cocoa are already delivering some killer applications.

Take browsers. OS X comes with a preview release of Microsoft Internet Explorer developed using Carbon. Thus far, I've had a better experience running the old version of IE in OS X's Classic mode than I have running the OS X version.

Then I discovered a $30 Cocoa-based browser called OmniWeb (800/315-6664, ext. 250, www.omnigroup.com), which is quickly becoming my favorite Web browser on any platform. It's fast in ways I never thought a browser could be, and it takes full advantage of Mac OS X's antialiased text features.

At one point, so many of the Carbon-based applications I was playing with were problematic, I began to think that Carbon was inherently slower and less stable than Cocoa. Then I got my hands on the Carbonized version of the $35 shareware image editor GraphicConverter (www.lemkesoft.com), which is more stable and faster than its OS 9 counterpart. That's how they're all supposed to be, right?

The Command Line

Perhaps the most noticeable advancement in OS X is actually very old technology: the command line. The Mac has never had a command line, and in the very early days this was one of the primary criticisms leveled against the Mac's graphical user interface. Without a command line, you lose the ability to hack around inside the guts of your computer, and as a result, you lose a certain amount of control.

I find that I'm spending a lot of time in the Terminal application, the gateway to the Mac OS X command line. In just a few weeks of playing around with it, I've already used the command line to move the Dock from its default location on the bottom of the screen to a new, more appropriate place on the right side. Sure, there are now shareware programs that will do this for you, but I did it in the command line and I'm proud of it.

Mac OS X is at once like the old Mac OS, and nothing like it. Command lines, open source, and Cocoa are all wrapped up in an extension of the Mac interface that is both familiar and new. It's a brave new Macintosh, one that opens bold new frontiers for Mac users. And it's up to us (and the Mac's intrepid developers) to blaze trails in this new world. **m**

ANDREW GORE is *Macworld*'s editor in chief. To comment, type **Vision Thing Forum** in the Search box at Macworld.com.

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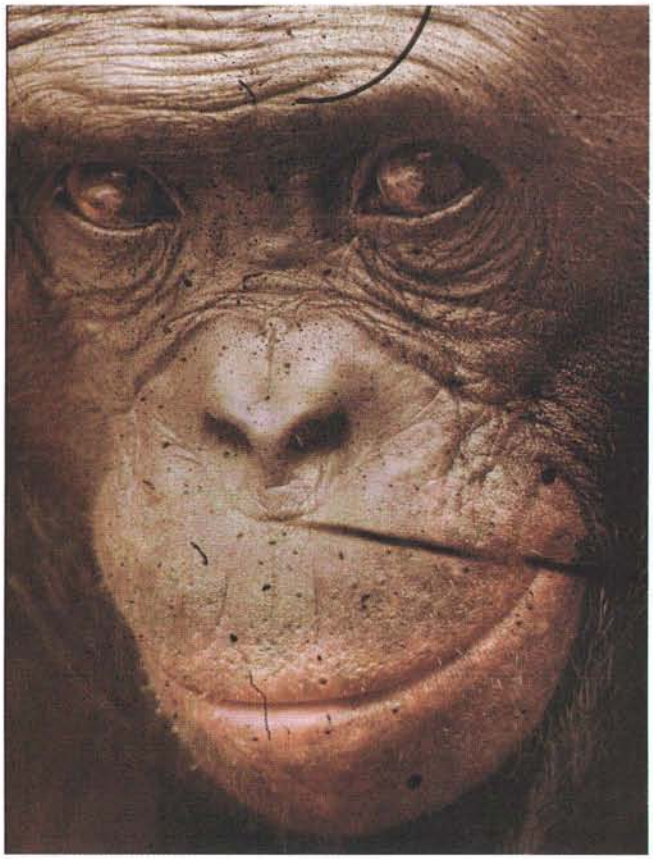

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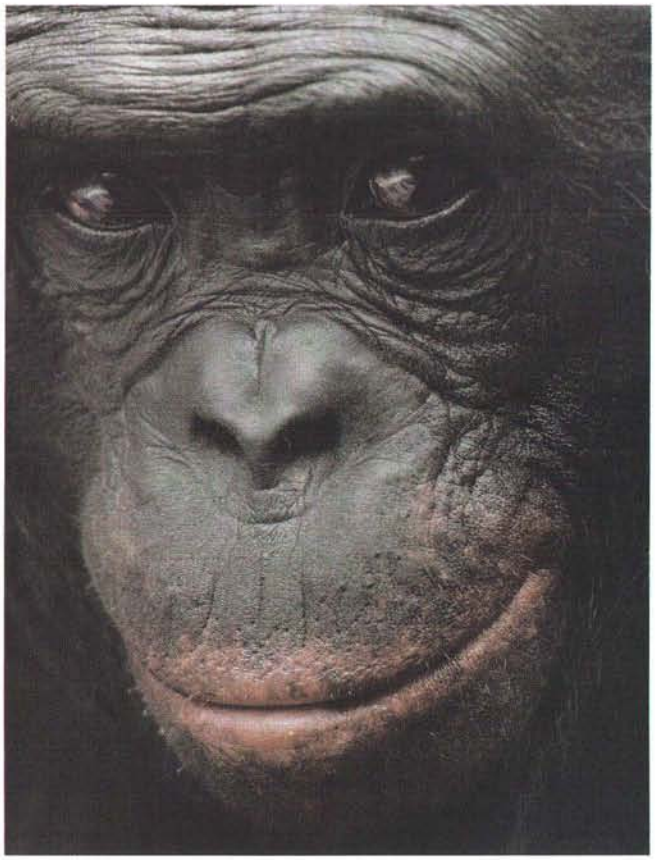

After

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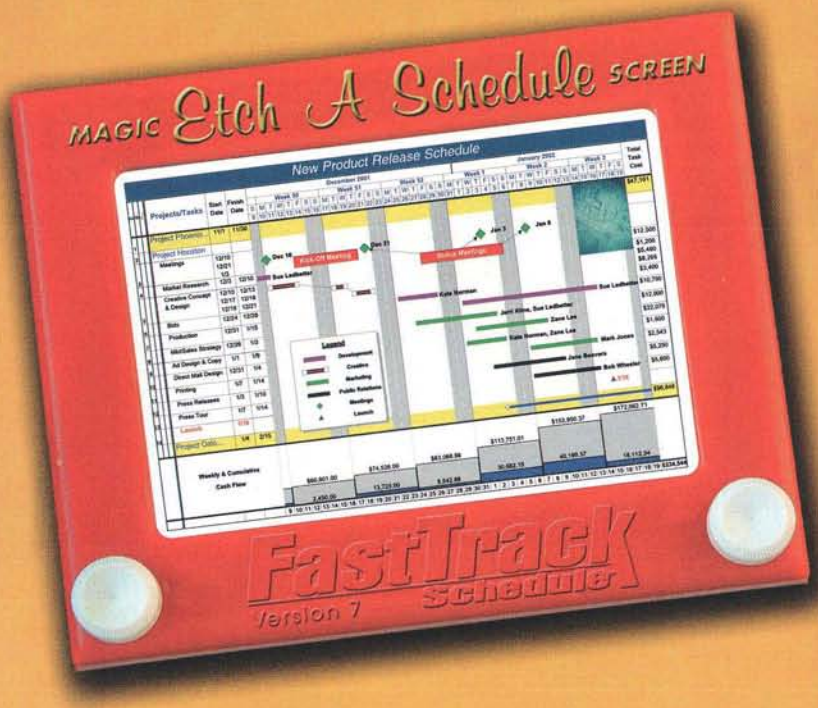

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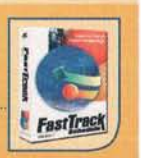

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Catalog, pg. 30

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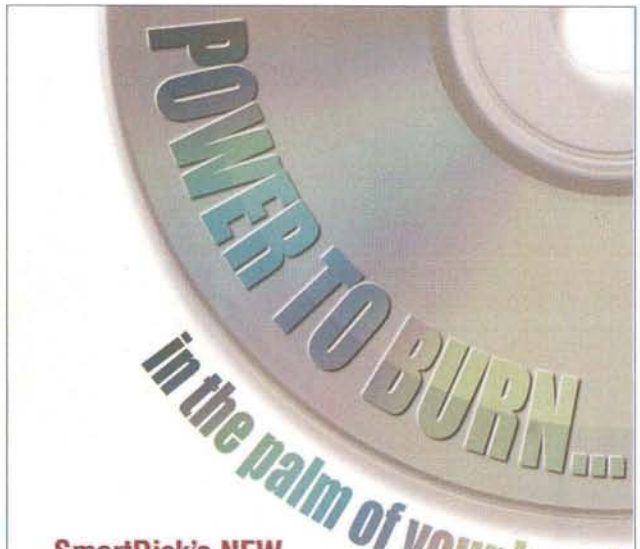

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Feedback

It Coulda Been a Contender

I always enjoy *Macworld*'s Eddy Awards ("The 16th Annual Editors' Choice Awards," March 2001). But this year I found a glaring mistake. In the Data-Management Software category, you picked SPSS 10.0, saying: "No other program can compete with SPSS in terms of the number-crunching power that it brings to your desktop."

I have to disagree with that assessment. Stata (800/782-8272, www.stata.com) is faster, stabler, more programmable and customizable, and completely cross-platform (Mac, Windows, and Unix), and it uses less memory. What's more, it can be automatically updated via its own Web engine. And unlike SPSS, it has been consistently supported on the Mac platform with simultaneous cross-platform releases. Finally, Stata's product support is unrivaled in the software industry. SPSS is a great product that I use weekly. However, it's clear that Stata not only competes with SPSS but also surpasses it in many areas.

Dan Frakes
San Francisco, California

Shame on Us

Shame on you for your giving an "award" to MyPalm ("The *Macworld* Web Awards," March 2001). This Web-based calendaring application may lack clutter, but it also lacks a Mac synchronization feature.

Don Shuwarger
Goode, Virginia

Because FamilyTreeMaker.com has stopped supporting the Mac platform, causing this Mac user (and probably others) to scramble for another genealogy program, I find *Macworld*'s endorsement of the site—in the form of a "Web Award"—grossly inappropriate.

Grace A. Nelson
Pendleton, Oregon

We also wish the Family Tree software still supported the Mac. However, the Web site is informative and accessible to all.—Ed.

Don't Trash That iMac!

After reading Andy Ihnatko's piece about making an aquarium out of an iMac ("Go Fish," *Buzz*, March 2001), I'm appalled. I am a volunteer in a first-grade classroom, where I help with the computers. There are only three machines in the room modern enough to have a CD-ROM drive.

If you're thinking of trashing a viable iMac to make an iMacQuarium, please think again and donate it to a school or other nonprofit that may be struggling along with old IIce's, as this classroom is.

Harry Henning
Marysville, Washington

Andy did write that if you've got an old, retired iMac that still works, you really should donate it to a school or other nonprofit. We agree that the message is worth repeating.—Ed.

But Still Faster Than a Speeding Bullet?

Though I would love to have one of Apple's new portables, I have to pick some nits with claims Apple has made about the Titanium PowerBook G4's case ("Apple Goes Platinum," *The Vision Thing*, March 2001). Titanium is neither stronger than many steel alloys nor lighter than aluminum.

I was a mechanical engineer at Northrop Grumman's structural test laboratory for ten years, so the claim jumped out at me.

An aircraft alloy of titanium, Ti-5Al-2.5Sn, has a density of 0.162 pounds per square inch (lb/in²), while 6061 aluminum has a density of 0.098 lb/in². A standard aircraft steel, 4130 Chromium-Molybdenum steel alloy, is easily heat-treated to an ultimate tensile strength (UTS) of 180 Ksi (1000 lb/in²). Some alloys can be hardened to 240 Ksi and higher. The titanium alloy mentioned above has a UTS of about 115 Ksi—definitely not stronger.

Chris Chernault
location withheld by request

You've Got Mail . . . Maybe

I wish I had read Lisa Schmeiser's review of Netscape 6.0 (*Reviews*, March 2001) before I downloaded the program. Using Netscape 6.0, I sent out (or thought I did) 54 e-mail messages. Although I had every indication that the messages went out perfectly, *not one of them was actually sent.*

I didn't discover the problem until a week had passed. I could get no help from Netscape, and I had a big job cutting and pasting each and every e-mail message (and adding apologies) into Netscape 4.76. The problem was never solved, and I have since deleted version 6.0 from my G3. An associate at work uses an Intel PC, and Netscape 6.0 for Windows did the same thing to him!

Jerry McMurry
San Diego, California

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CORRECTIONS

H&R Block Financial's Kiplinger TaxCut Home and Business (Reviews, April 2001) is a Windows product. The Mac version is Kiplinger TaxCut Deluxe.

Macromedia Fireworks 3 costs $299 ("The 16th Annual Editors' Choice Awards," March 2001). **m**

The Feedbag

Who says music soothes the savage breast? Try publishing a list of perfect albums, as Andrew Gore, *Macworld*'s editor in chief, did in our March 2001 issue. It didn't do much soothing, and it sure awakened the savage in some of our readers.

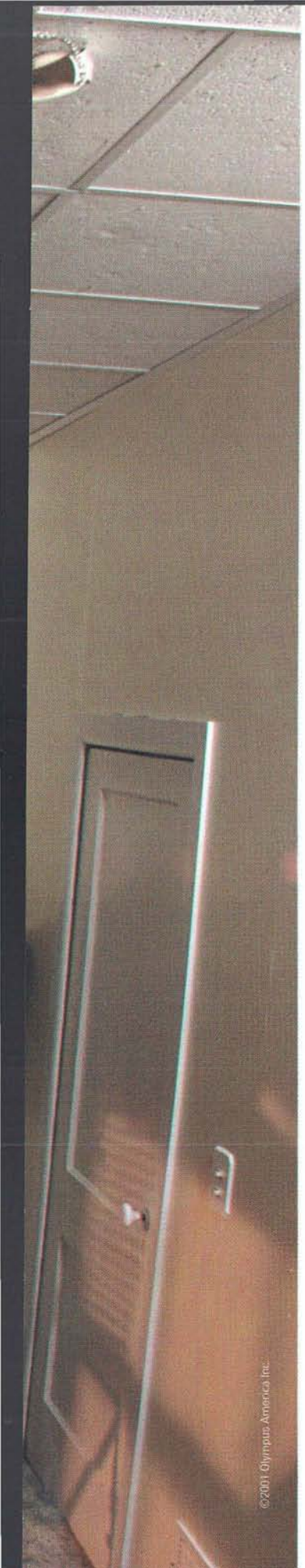
"Sinéad O'Connor's *I Do Not Want What I Haven't Got* is far superior to Alanis Morissette's *Jagged Little Pill*," says concerned reader-cum-music-critic Chris. "The thought of anyone putting *Jagged Little Pill* on their perfect-album list makes me cringe." If that makes you cringe, Chris, you should have seen Andy's first draft, which included Milli Vanilli's *Girl You Know It's True*, the Bee Gees' *Life in a Tin Can*, and Sid Vicious's *Sid Sings*. But in the end, our wily boss chose Alanis as a blatant ploy to appeal to our Canadian readers.

One reader—presumably *not* from Canada—felt that we excluded a crucial decade from our list. "Where," asked curious reader Michael, "are the great albums of the eighties?" That's something we started asking in late 1989, Mike. We think it may have had something to do with Reaganomics.

But reader Craig was singing a different tune: "Imagine my satisfaction at seeing your reference to an obscure 1967 Pink Floyd number, *Interstellar Overdrive*." *Obscurity* is our watchword, Craig. And check out this month's fun Floyd folly: If you read this issue aloud, you'll find that it syncs up perfectly with *Dark Side of the Moon*. Start the CD just as you turn to this month's *The Vision Thing*, and shine on, you crazy diamond!

Of course, some folks wanted us to know that we had no business listening to music in the first place. "Downloading MP3s of music without the permission of the artists and their record companies is theft, as any educated person knows," says Bill. "Although it is certainly easy to download these files, it is a mark of character to resist the temptation." Which anyone who'd heard the story about a serpent tempting Eve with a CD-ROM of illegally downloaded Barry Manilow songs would know.

Speaking of temptation: "In my teens, I would always sneak a peek at the cover of *Playboy*: those girls were sexy," says Scott. "Thirty-five years later, I look at the cover of the March 2001 *Macworld* and think 'Boy, that computer is *sexy*!' Tell me, when did I get my priorities mixed up?" We're not sure, Scott, but our guess would be a certain year in the eighties, when both the greatest computer and greatest album of all time were released. We're talking, of course, about the Macintosh and Van Halen's *1984*.



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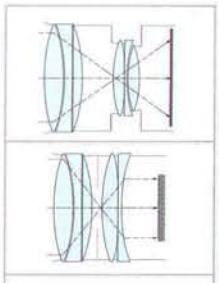
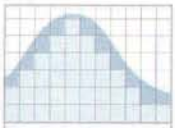


Film lenses refract light at an angle. The CAMEDIA lens refracts light directly into the pixel wells, filling them with information fully.



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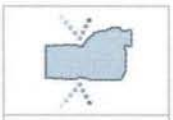
It began with a 4 million pixel CCD. To take full advantage of such small pixels, the E-10 lens had to have a resolution three times better than that of a 35mm lens. It also had to direct light at much flatter angles than a film lens, in order to fill the pixel wells properly. Clearly, simply attaching an existing film lens to a digital body wasn't good enough.



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Light: Studio strobes with beauty dish

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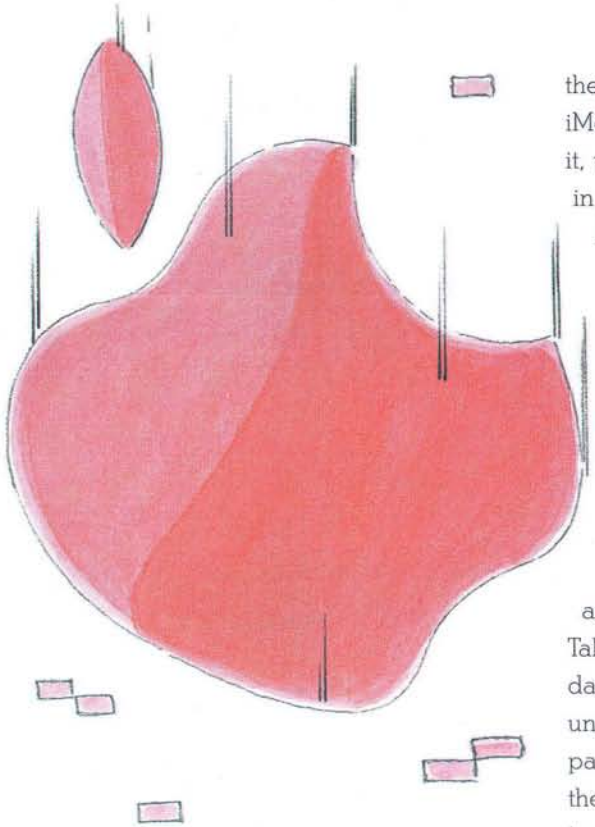

Toasting the Competition?

With the release of iTunes and iDVD, Apple hopes to position the Mac as the hub of our digital lives. But will the success of Apple's free software come at the expense of Mac developers with similar programs?

Apple's latest marketing strategy is simple: if you have digital devices, manage them with a Mac. "As we looked at what iMovie did and the response we got from it, we saw a lot of other devices that are in that camp," explains David Moody, Apple's senior director of marketing.

Hence the release of iTunes, for MP3 playing and CD burning, and iDVD, for DVD authoring. A recent iTunes update allows the software to work with other manufacturers' CD-RW drives—not only Apple's (see *Reviews* elsewhere in this issue).

That's great—unless you happen to make software similar to the free applications Apple has just released. Take Toast, the longtime CD-burning standard from Adaptec's Roxio unit. At iTunes' unveiling, Apple CEO Steve Jobs compared iTunes with Toast and implied that the new application from Apple was easier to use.

That doesn't faze Victor Nemechek, product manager for Toast. "I don't think we need to compete head-to-head with iTunes," he says. "There will be a lot of people that max out iTunes' capabilities, want do more, and will then upgrade to Toast. They will want to convert their LPs into CDs, burn Disc-at-Once CDs, make labels for their CDs."

Then there's Casady & Greene's SoundJam, which bears striking similarities to iTunes—so many that it's rumored Apple struck a deal with Casady & Greene to adapt the latter's software. (Neither company would comment.)

So how can Roxio, Casady & Greene, and other makers of CD-burning software keep from getting squashed by free appli-

STEVE PICA

cations? They should look to the example set by video-editing–software developers, who faced a similar challenge from Apple's free iMovie. By focusing on the semiprofessional and professional markets, they were able not only to coexist with iMovie but also to thrive.

"It's hard to compete against free," concedes Mike Micheletti, product manager for CineStream, from Media 100. "But it's not too often that we run into consumers who are choosing between our product and iMovie."

Apple's entry into an arena can inspire developers to add new features to their software—CineStream, for example, now offers the ability to embed hot spots with URLs directly in videos.

Rather than crushing rival products, Micheletti says, iMovie has raised awareness of digital video. "A lot of that public awareness you can attribute to iMovie and the national TV spots to promote it," he adds. "Long term, we think it's a good thing."

As for Apple's next move, don't expect iTunes and iDVD to be the only new applications released by the company. Apple's Moody won't speculate on what the company will do next, but he does see the digital-hub strategy as a key part of Apple's future. "There are a lot of digital devices out there," Moody says. "And we have our eye on them."—MATHEW HONAN

Toast Turns Titanium

Apple has muscled in on Toast's territory. So it's only fitting that Roxio has put out a Titanium product of its own—Toast Titanium (866-280-7694, www.roxio.com). This $99 version of the CD-burning program ($59 for an upgrade) includes Toast DVD, formerly sold separately. You can't use Toast Titanium to author a DVD—but you can burn DVD images using a DVD recorder. Don't have one? Don't fret—Toast Titanium has an enhanced VCD (VideoCD) feature. Plug-ins let you export VCD-compatible MPEG-1 files, directly from iMovie or QuickTime, that will play on most DVD players. And Toast Titanium now supports background burning, so you can work on the great American novel while you burn an *ABBA's Greatest Hits* CD. This version also adds support for all QuickTime files; if QuickTime can play it, Toast Titanium can make an audio CD from it. Side apps such as MVP, iView, and Spindoctor are full installs in Toast Titanium. iTunes may be brand new, but it sounds as though the latest version of Toast is anything but stale.—ANTON LINECKER

COOK DIFFERENT

A GRILL FOR THE REST OF US

Take one look at the latest George Foreman Lean, Mean, Fat-Reducing Grilling Machine, from Salton (800/233-9054, www.salton-maxim.com), and you might notice a slight resemblance to a certain brand of personal computer. It would be cynical to suggest that the $30, multicolored, translucent grill is a stone-cold ripoff of Apple's iMac—think of it, rather, as an homage—but an in-depth investigation revealed a number of eerie resemblances between the two products.—GREG KNAUSS

The iMac	The Grill
Has a revolutionary and strikingly original design.	Copies a revolutionary and strikingly original design.
Features designer colors such as indigo, graphite, and Flower Power.	Features designer colors such as mustard, grape soda, and clogged artery.
Includes software that lets anyone make iMovies.	Includes a recipe that lets anyone make pork chops.
Burns CDs.	*Really* burns CDs.
Sports 64MB to 128MB of installed memory.	Sports hot-grease trough.
Apple CEO Steve Jobs once shouted at an underling in the company parking lot.	Spokesman George Foreman once fought Muhammad Ali in *Rumble in the Jungle*.
Runs software significantly better than Windows does.	Runs software significantly better than Windows does.
Infinite creativity.	Cooks meat.

More Info: www.salton-maxim.com/salton/grill/movies/320x240.mov

Through the miracle of QuickTime, see the iMac-like George Foreman Grill in action. Any similarities to an Apple TV commercial are purely coincidental.

LINK

BUZZ

MACS AT WORK

IT'S ALL IN THE GENES

For more than a decade, scientists have been attempting to map the human genome, the full set of genes that make up humans. Figure out the order of genes, and you can identify variations in the genetic code that cause disease. You can then develop medicine that fights genetic diseases.

Human Genome Sciences (HGS) is one of the biotechnology firms looking to crack the genetic code.

Macs have played a major role at HGS since the Rockville, Maryland–based company opened its doors in 1992, says Vice President and Chief Information Officer Mike Fannon. HGS started with 50 Mac-controlled DNA-sequencing instruments, and it built custom applications to store and analyze data and transfer it to Unix databases. "If you went with something else, you were rowing upstream," Fannon says.

The Mac handled TCP/IP in "a very natural way" and proved to be "a very good client machine for the kind of applications we were writing," Fannon adds. Most of HGS's molecular biologists were used to working on Macs, making the decision to go with the platform even easier.

As HGS has grown—it now has five drugs in human clinical trials—it has moved beyond the Mac. The company now writes browser-based proprietary applications that work on multiple platforms.

But HGS has hardly turned its back on the Mac: with about 400 Macs among the computers at its facilities, the company remains a predominantly Mac operation.

Power Mac G4s and PowerBooks make up the bulk of HGS's Mac arsenal, Fannon says, "but we have quite a spectrum, since we've been buying them for eight and a half years."

The oldest Mac on the premises? A handful of pre-PowerPC machines—or at least that's what Fannon thinks. "Who knows what's lurking back there?" he laughs.—PHILIP MICHAELS

MAC STUFF

CAPTAIN VIDEO

You have to hand it to Apple's iMovie and Adobe Premiere. Those programs give any aspiring director powerful, affordable tools for editing digital video—everything from vacation movies to a low-budget remake of Ingmar Bergman's *The Seventh Seal,* with the neighbor's kid starring as Death. But unless you want to cough up a couple hundred bucks for a professional-quality jog-shuttle controller, you're stuck hunting and pecking on a keyboard or fumbling with a mouse. Amateur moviemakers who don't want to bust their budgets should zoom in on the ShuttlePro Multimedia Controller, from Contour Design (800/462-6678, www.contourdesign.com). The ergonomic USB device offers pro capabilities at the consumer-friendly price of $100. A jog-shuttle knob gives you frame-by-frame control, and the ShuttlePro has 13 programmable buttons for frequently used commands. The ShuttlePro's software is Mac-only, though a Windows driver may be out by mid-April. And that's a plot twist that would make even Bergman happy.—PHILIP MICHAELS

DIGITAL ILLUSTRATION BY DAN DOERNER; PHOTOGRAPH BY STEPHEN SUGG

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This is TechTool Pro...

Nothing can ruin your day faster than a broken computer. And while Macintosh is one of the most reliable computers in the world, sometimes things can go wrong. That's why we invented TechTool Pro. TechTool Pro is the super-utility that can find and isolate almost any problem on your computer. No other utility in the world comes even close to covering as many aspects of your Macintosh as TechTool Pro.

But diagnosing computer problems is only half the battle. Besides repairing drives, recovering data and checking the health of your Macintosh components, TechTool Pro can now help protect you against virus problems and software conflicts. TechTool Pro can also keep your Mac running at its peak between problems. The program optimizes your disk drive to make your computer run faster and more efficiently. Our RAM panel even allows you to see the inner configuration of your memory without opening your computer case.

Do all these features make TechTool Pro complicated to use? Not at all. The Multitester feature allows you to give your computer a full checkup with one click of your mouse. TechTool Pro even creates graphic, easy-to-read and understand reports. Now you can know the state of your computer without having a degree in computer science.

Every day, more and more Macintosh professionals are choosing TechTool over other system utilities. In fact, even Apple Computer includes TechTool Deluxe with every copy of their AppleCare™ Protection Plan. Simply put, TechTool Pro 3 is the most complete and powerful troubleshooting utility available for your computer. Why would you settle for anything less?

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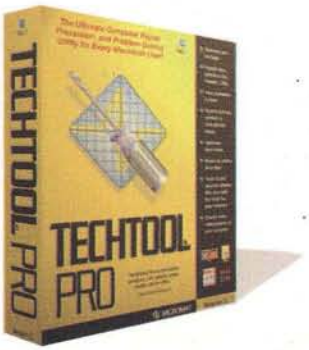

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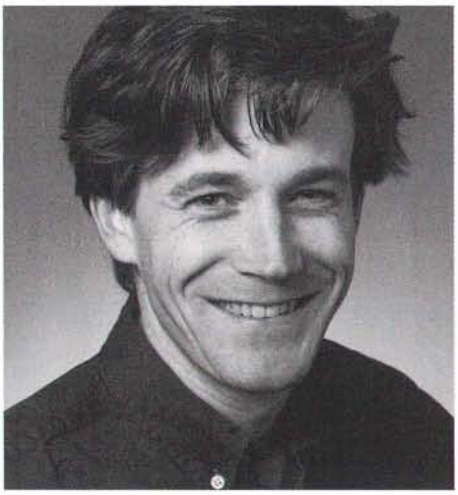

PRO FILE

Drawn to the Mac

Q&A with BILL AMEND

In the comic strip FoxTrot, *tech-savvy Jason Fox has nothing but scorn for the iFruit, a colorful (and fictional) computer that bears a striking resemblance to some high-profile Apple hardware you might recognize. Fortunately, Jason's creator, Bill Amend, doesn't share that disdain—the cartoonist loves his Mac so much, he uses it to produce the strip, which appears in roughly 1,000 newspapers. It's all part of Amend's love affair with technology, which began more than 20 years ago.*—DAVID FERRIS

Q: ***How do you use technology to create your strip?***

A: About a year ago, I started assembling the daily strip digitally on my Mac. I still do the art with pencils and paper, but I scan the images and use Photoshop to position and shade them. I made a font of my handwriting with Macromedia's Fontographer, which turned out well. Putting the strip together digitally allows me greater flexibility to change dialogue and art right up until the last second, which is typically the case.

Q: ***What made you decide to spoof the iMac in your recent collection of strips, "Think iFruity"?***

A: It was time to upgrade the family's computer, and the iMac was new and all the rage and seemed a perfect fit. Not wanting to seem too much in a major corporation's pocket, however, I came up with the iFruit line of computers as a means of affectionate parody.

Q: ***In FoxTrot, Mom loves the iFruit while her son Jason, a technogeek, can't stand it. What does this say about your own feelings toward Apple's colorful products?***

A: I see both Jason's and his mom's points of view as valid. The mom in me wants whatever computer I own to work without me having to think about it; the Jason in me wants the intellectual thrill of commanding a really complicated system. I'd love to see Apple introduce a limited-edition geek model, with, like, 64 expansion slots, an 18-inch fan, a clear enclosure so you can see all the wires, room for a couple dozen extra processors. I think that'd make Jason happy.

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More Info:
www.macworld.com/2001/06/buzz/amend.html

When he's not drawing *FoxTrot*, how does Bill Amend use his Mac? Find out in our extended online interview.

LINK

NVIDIA'S MAC MOVES

Graphic Improvement

Few would dispute the notion that Nvidia's GeForce3 (408/615-2500, www.nvidia.com) marks a quantum leap forward in graphics cards. Thanks to a proprietary chip technology called the NfiniteFX engine, the GeForce3 lets programmers create rich 3-D worlds.

NfiniteFX gets its kick from Vertex Shaders and Pixel Shaders, which allow programmers to build detailed motion and realistic surfaces into games. The GeForce3 is also twice the speed of most available graphics processors.

But to get optimum performance, programmers need to write specifically for the GeForce3. Some gamers fear that developers won't work on GeForce3-enhanced games for the Mac: the size of the market may not justify the cost.

Still, those games will come, thanks to an unlikely source—PCs. Porting PC games written for the GeForce3 won't require the resources needed to write those games for the Mac. "We haven't seen too much of the driver stuff yet," says Aspyr CEO Michael Rogers, "but I feel like people are going to jump on it pretty quickly because it's such a noticeable difference." Aspyr will update its titles, and Rogers expects others to do the same.

Nvidia says it's doing all it can to prepare developers for the GeForce3. Says Spokeswoman Diane Vanasse, "GeForce3 has full support for legacy applications, so the end user will see an immediate benefit if they decide to upgrade."—MATHEW HONAN

What's HOT

A QUICK LOOK AT THE WORLD OF TECH

1. A judge's ruling means the end of Napster as we know it. *Under the new rules, founder Shawn Fanning drives to your home to swap mix tapes he recorded off the radio.*

2. Sony buys Virtual Game Station from Connectix. *Just goes to show that if you can't beat 'em, buy 'em. Then beat 'em.*

3. You can now buy a G4 Cube for less than the price of an iMac SE. *At the rate Apple's cutting Cube prices, by Christmas you'll be able to get one for a couple of sawbucks and a stick of gum.*

4. Nvidia's GeForce3 graphics chip will debut in Mac systems before it hits PCs. *Imagine the terrible humiliation of discovering that your Sims are better looking than you are.*

5. New Flower Power and Blue Dalmatian iMacs were designed by Apple to "look like music." *As long as we're talking about John Tesh's music, we agree.*

Product WATCH

RELEASED

- New PDAs from Palm (800/881-7256, www.palm.com): The $199 **Palm m105**, the $399 **Palm m500**, and the $449 **Palm m505** completely support Macs. The handhelds ship with a USB cradle; Mac users don't have to buy a separate PalmConnect kit.
- New color printers from Lexmark (888/539-6275, www.lexmark.com): The **C270** laser printer prints 6 color and 24 black-and-white pages per minute in 2400 Image Quality mode. It comes in three models that sell for $1,999, $2,399, and $2,799. The **J110** inkjet printer features a resolution of 2,400 by 1,200 dots per inch. It prints 10 color and 16 black-and-white pages per minute. The J110 sells for $899; the J110tn sells for $999.
- A serial adapter from Keyspan (510/222-0131, www.keyspan.com): The $149 **Keyspan USB 4-Port Serial Adapter** lets four serial devices connect to a single USB port.

UPDATED

- Wireless-networking software from Apple (800/692-7753, www.apple.com): **AirPort 1.3** adds Point-to-Point over Ethernet (PPPoE) and DHCP client-ID support, giving the software functionality required by some ISPs. The free download requires Mac OS 9.0.4 or later.
- RealBasic from Real Software (512/263-1233, www.realsoftware.com): **RealBasic 3** adds OS X support, a new animation engine, revamped database features, and enhancements to the Code editor and debugger. The standard edition of the object-oriented development software sells for $150; the professional edition sells for $350.
- Cross-platform software from Miramar Systems (800/862-2526, www.miramar.com): **PC MacLan for Windows 95/98/Me** adds IP client, IP server, and bidirectional printer support. It sells for $199. Existing users can upgrade for $69 to $99.

ANNOUNCED

- A redesigned Web-tools site from Apple (http://itools.mac.com): **iTools** features a new interface with remodeled navigation bars, additional fonts and images for iCards, and added support for Japanese. The site has dropped iReview, Apple's online Web-site review service.—Compiled by PHILIP MICHAELS

FREEHAND 10

Macromedia's Carbon Date

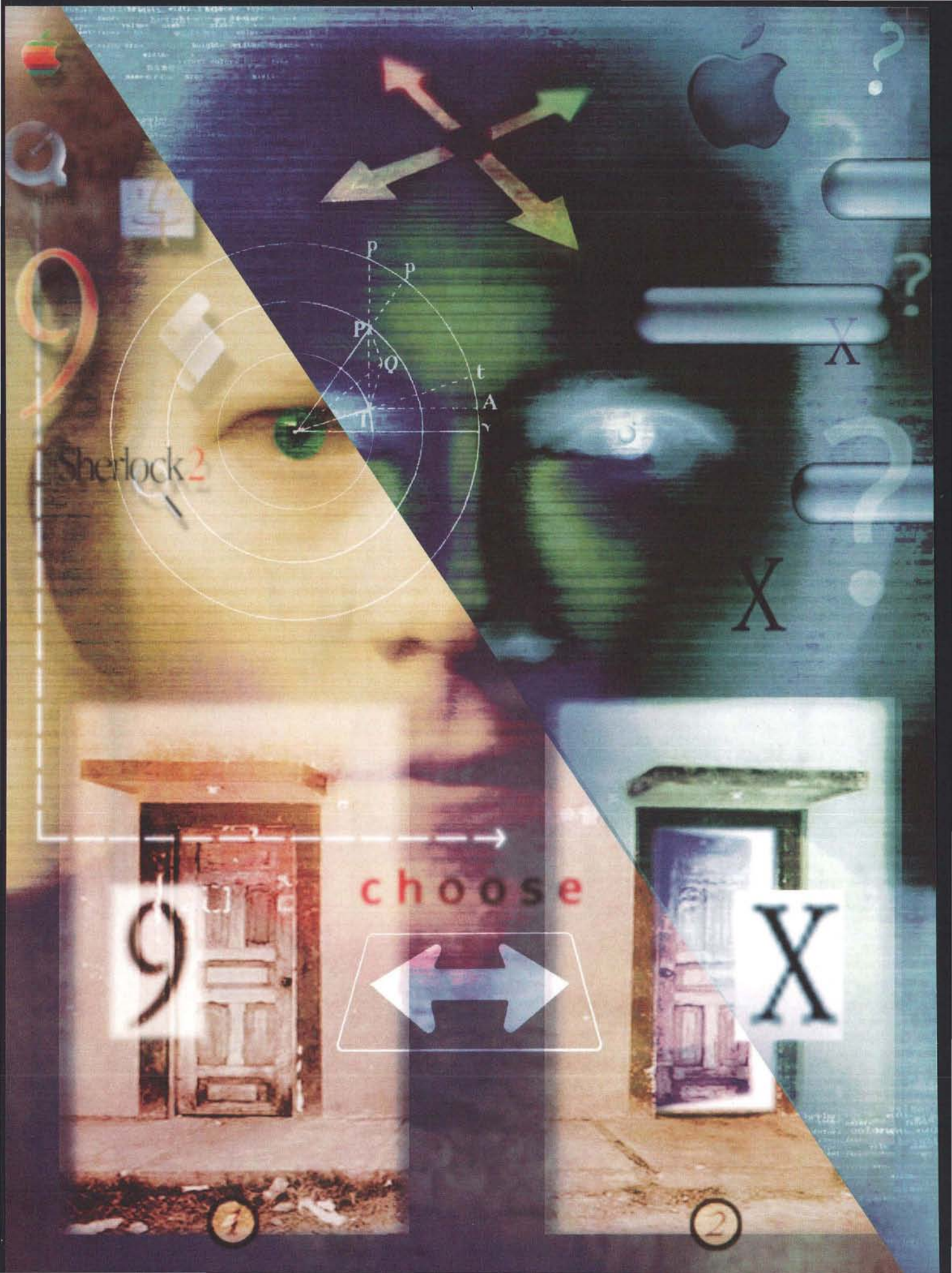
The latest version of FreeHand features new productivity tools, a redesigned interface, and tighter integration with programs such as Flash. But it's FreeHand 10's system compatibility that will likely grab the most attention for the illustration and layout application from Macromedia (800/470-7211, www.macromedia.com)—the software will run natively on OS X.

"FreeHand is the first professional illustration program of its kind to be Carbonized," says Macromedia Product Manager Keith Hutchinson. FreeHand certainly beat rival products to the punch. Adobe (800/833-6687, www.adobe.com) says the next major release of Illustrator will be OS X savvy, although it won't comment on when that release is coming. The last major upgrade, version 9, came out a year ago. Corel (800/772-6735, www.corel.com) plans to release a Carbonized version of CorelDraw in July 2001.

The latest FreeHand update—which also runs on Mac OS 8.6 and higher—is more than just an OS X–ready application. Macromedia added a Master Pages feature to FreeHand for creating objects and page attributes that can be shared across a document. Make a change to the master page, and it occurs in the child pages. A Symbol Library feature lets you edit objects and apply changes across multiple copies or instances. "*Productivity* is really the watchword for this release," Hutchinson says. New illustration tools include a Contour Gradients feature, reminiscent of the Gradient Mesh feature in Illustrator 9, and symbol-based brush and spray strokes.

Like other recent upgrades from Macromedia, FreeHand 10 now sports a common Macromedia interface, making it easier to use with programs like Flash and Fireworks. The latest version also tightens FreeHand's Flash integration—a navigation panel lets you test SWF animations in FreeHand before exporting them to Flash.

Expected to ship by late April, FreeHand will sell for $399. Current owners of the program can upgrade for $129. Macromedia will offer the illustration and layout software in a suite with Flash 5 for $499.—PHILIP MICHAELS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ARE YOU READY FOR OS X?

BY HENRY BORTMAN

MACWORLD LAB HELPS YOU DECIDE

ILLUSTRATIONS BY ALICIA BUELOW

Macworld LAB TEST

OS X IS HERE AT LAST, AND YOU CAN'T WAIT TO BEGIN USING IT. THE IMPULSE IS UNDERSTANDABLE, BUT SWITCHING TO OS X MAY NOT BE PRUDENT.

Usually, when Apple releases a new version of the Mac operating system, the questions you have to ask yourself are: Am I ready? Do I have the right model Mac? Is upgrading worth the cost? (In OS X's case, that's $129.) All of these questions apply to Mac OS X, but this time there is another, equally important question to ask yourself: Is Mac OS X ready for me?

This is a brand new Mac OS, built from the ground up. There is a chance that it will run your current applications more slowly (or not at all), that your external hard drive or printer will not be compatible with it, and that it will be unbearably poky. Macworld Lab and I hooked up dozens of peripherals to see which ones worked with OS X. We compared the speeds of applications running in Mac OS X and OS X's *Classic* environment (which lets you run Mac OS 9 applications within OS X) with those of applications running in Mac OS 9.1. (See "A Perfect 10?" for details.)

Should you upgrade? Let's take a look at the factors that will affect your decision.

Tomorrow's Mac

There are a lot of reasons to switch to Mac OS X. First, it's the future. This summer, Apple will begin shipping all Macs with OS X installed. Apple will continue supporting Mac OS 9 on older machines for some time, but OS X will be the focus of all future improvements to the Mac.

That's a good thing. OS X is a delight to look at. Sit in an Internet café with OS X running on your PowerBook—make sure you're positioned so that other people can view your screen—and you'll see what I mean. People notice OS X.

But OS X's beauty is more than skin deep. It's built on a solid foundation: Unix. As a result, Mac OS X should prove more crash-resistant than previous versions. OS X also takes advantage of multiple processors better than OS 9 ever has. Users of dual-processor machines should eventually feel an overall performance boost in day-to-day work.

Like a Rock Perhaps the most important reason to switch to OS X is an invisible one: stability. The new operating sys-

tem does away with extensions and control panels, which are often the cause of crashes. Moreover, when an OS X–native application *does* crash, the operating system and other active applications keep running—most of the time—so you don't have to reboot your Mac. When applications running in Classic crash, however, they can hang up the Classic environment and all programs running within it. But as more OS X–native applications become available, crashes should be few and far between.

To help you avoid system meltdowns, Mac OS X provides a new version of the Force Quit feature. If an application freezes or seems to be endlessly spinning its wheels, pressing ⌘-option-escape will start the Force Quit utility, from which you can shut down not only the troublesome application but also any running applications. You can also quit the entire Classic environment.

Aqua Appeal The most obvious reason to switch to OS X is its interface. Aqua is arguably the best-looking computer user interface ever designed. It takes advantage of the PowerPC G4 microprocessors' computational muscle to provide smooth antialiased text, transparent windows and menus, and animated interface elements. Some people (I'm one of them) think Apple has gone a little too far in the eye-candy department. But even we curmudgeons have to agree that Aqua is a thing of beauty and a joy to behold.

In addition to the luscious *look* of Aqua, Apple has brought a lot of changes to the way users interact with their Macs. See "The Face of OS X" for a visual guide to the elements of the new interface.

What's Missing

With all that OS X has going for it, why should you wait to switch? Three reasons: performance, applications, and drivers.

Performance It's a bit early to make definitive pronouncements about OS X's performance. Its real benefits will be known only after the arrival of OS X–native versions of applications, which take full advantage of the OS. For now, most must run in Classic mode. But we do have some preliminary results to report.

Most people who have loaded OS X will tell you that the Finder "seems slow." Our tests confirmed this. Timed against the Finder in OS 9.1, OS X's Finder made a disappointing showing when we asked it to open about 200 folders. Running OS X on G4 systems did close the speed gap significantly, and even on G3 systems, increasing RAM from 128MB to 256MB improved scores substantially. See "A Perfect 10?" for more test results (from Macs with 256MB of RAM only).

In most Adobe Photoshop tests—Photoshop runs only in OS X's Classic environment—OS 9 had an edge over OS X that ranged from slight to very significant. Here, too, performance improved greatly on the G4 systems. In our Microsoft Excel test, a spreadsheet calculation took anywhere from two to four times as long in Classic as the same calculation in Mac OS 9.1 straight up. Ouch!

OS X showed promise in one area: scrolling through a PDF document. This test showed us some of the potential of OS X–native applications. Because graphics in OS X are based on PDF, scrolling through a PDF document was at least twice as fast in OS X as in OS 9.1.

OS X seems optimized to take advantage of the G4's AltiVec instructions. (AltiVec is a set of PowerPC instructions paired with a vector-processing unit that enables a G4 chip to perform calculations on up to 16 data elements simultaneously—in applications written for AltiVec.) But OS X also appears to like lots of RAM. When we installed OS X on several

What You Need to Try OS X

- Mac OS X ($129; Apple Computer, 800/692-7753, www.applestore.com)
- A Power Mac G3, G4, or G4 Cube; an iMac; an iBook; or a PowerBook G3 or G4 (The original PowerBook G3 is not supported.)
- 128MB of RAM (*Macworld* recommends 256MB or more if you'll be spending time in the Classic environment.)
- 1.5GB of available hard disk space

Macworld systems, we found that Macs with less RAM slowed to a crawl when asked to do difficult tasks, or multiple tasks at once.

Applications As we went to press, few popular programs had been upgraded to take advantage of Mac OS X's new features. Most widely used applications won't be available in Mac OS X–native versions until summer or fall. (See "Applications: The Missing Link.")

You can run OS 9 applications in OS X's Classic mode—but why bother? Doing so won't give you any of the advantages of Mac OS X, and programs often run more slowly. It's true that you can switch back and forth between Mac OS 9 and Mac OS X as necessary. But would that really be an improvement?

Drivers A less obvious problem with OS X is the lack of native hardware drivers. Drivers are special pieces of software that handle interactions between your Mac and the things attached to it. Without them, many of your peripherals won't work. Devices awaiting OS X–native drivers include many printers, scanners, RAID arrays, CD and DVD drives, video-capture cards, cameras, and fax modems.

With the new OS, Apple provides built-in drivers that support many popular USB ink-jet and laser printers, USB and FireWire hard disk drives, and USB digital cameras. In our tests, all of these devices worked as expected. Printing went smoothly, we were able to attach and detach drives without a problem, and our Olympus E-10 digital camera worked fine with OS X's Image Capture application.

We had mixed results with USB scanners. Our Canon CanoScan FB 630Ui scanner worked with applica-

continues

Applications: The Missing Link

These projected ship dates were current at press time, but check Macworld.com for updates. The HyperJeff Network (http://osx.hyperjeff.net/apps) lists all applications currently available for Mac OS X.

COMPANY	APPLICATION	OS X VERSION	CONTACT
PRODUCTIVITY			
Apple	AppleWorks	Beta available now	800/692-7753, www.apple.com
FileMaker	FileMaker Pro	Spring 2001	800/325-2747, www.filemaker.com
Intuit	Quicken	2001	800/811-8766, www.quicken.com
Microsoft	Office	Fall 2001	800/426-9400, www.microsoft.com
Palm	Palm Desktop	TBD[A]	800/881-7256, www.palm.com
Power On	Now Up-to-Date & Contact	Summer 2001	800/344-9160, www.poweronsoftware.com
UTILITIES			
Aladdin	StuffIt	Available now	831/761-6200, www.aladdinsys.com
Dantz	Retrospect Backup Client	April 2001	925/253-3000, www.dantz.com
Micromat	Drive 10	April 2001	800/829-6227, www.micromat.com
	TechTool Pro	Fall 2001	
Netopia	Timbuktu	Beta available now	510/814-5100, www.netopia.com
Power On	Action Utilities	TBD[A]	800/344-9160, www.poweronsoftware.com
	Rewind	Fall 2001	
Symantec	Norton AntiVirus	TBD[A]	800/441-7234, www.symantec.com
	Norton Utilities	TBD[A]	
INTERNET			
Adobe	Acrobat Reader	TBD[A]	888/724-4508, www.adobe.com
Microsoft	Internet Explorer	Beta available now	800/426-9400, www.microsoft.com
	Outlook Express	TBD[A]	
Netscape	Netscape Navigator	TBD[A]	650/254-1900, www.netscape.com
Qualcomm	Eudora	Beta available now[C]	800/238-3672, www.eudora.com
WEB AND PRINT PUBLISHING			
Adobe	GoLive	TBD[A]	888/724-4508, www.adobe.com
	Illustrator	TBD[A]	
	ImageReady	TBD[A]	
	InDesign	TBD[A]	
	Photoshop	TBD[A]	
Bare Bones Software	BBEdit	Spring 2001	781/687-0700, www.barebones.com
Macromedia	Director 8 Shockwave Studio	TBD[A]	800/457-1774, www.macromedia.com
	Dreamweaver	TBD[A]	
	Fireworks	TBD[A]	
	Flash	TBD[A]	
	FreeHand	May 2001	
Quark	QuarkXPress	TBD[AB]	800/676-4575, www.quark.com
DIGITAL VIDEO AND AUDIO			
Adobe	AfterEffects	TBD[A]	888/724-4508, www.adobe.com
	Premiere	TBD[A]	
Apple	Final Cut Pro	Summer 2001	800/692-7753, www.apple.com
	iDVD	Summer 2001	
	iMovie	Available now	
	iTunes	Available now	
Casady & Greene	SoundJam	TBD[A]	800/359-4920, www.soundjam.com
Digidesign	ProTools	TBD[A]	650/842-6698, www.digidesign.com
Terran	Cleaner 5	Available now	800/572-3487, www.terran.com

[A]TBD = to be determined; at press time, a ship date had not yet been announced. [B]Quark 5.0—due out later this year—will not be OS X native, but the next version should be. [C]A final version of an OS X–native Eudora is expected in spring 2001.

The Face of Mac OS X

OS X'S RADICAL LOOK WILL EITHER TEMPT YOU TO UPGRADE or turn you off. The new Aqua interface is stunning: beautifully antialiased text, transparent windows and menus, and pervasive—some would say gratuitous—animation. Underneath the pretty face, however, is a completely new operating system. Apple has worked hard to hide the Unix underpinnings, but you'll find many differences as you try to move around and get things done.

PDF Everywhere OS X has built-in PDF support, so you can create a PDF version of your document from any OS X–native application. Other people need only Acrobat Reader to view it. This built-in PDF-generation capability also enables you to create a preview of a document before you print it, so what you see is really what you get.

Sheets Debut Another innovation truly new to Mac OS X is *sheets*. A sheet is an interactive dialog box, for saving or printing a document, that slides gently down from the document's title bar when you invoke it. Sheets remain attached to their documents, and they're perfectly happy just to hang out until you get to them. They don't demand that you deal with them before doing other work, as their OS 9 counterparts do.

Automatic Connections Once you've configured your networking connections in the new Network pane, OS X helps you out by switching among connection types, automatically selecting the best available connection. For example, imagine you can connect your PowerBook to your office network by either Ethernet or AirPort. Mac OS X will look for the Ethernet connection first, because it's the fastest, but if it can't be found, OS X will default to an AirPort connection.

Missing in Action What *can't* you do anymore? You can no longer drag windows around by their edges, only by their title bars. Spring-loaded folders are gone, too. Formerly, when you dragged a file to a folder on the desktop and held the mouse button down for a moment, the folder would pop open. You could then drag the file to an enclosed folder, and so on down the folder hierarchy until you reached your desired destination. This innovation made it possible to move or copy a file without having to first open its destination folder. Alas, OS X offers no such convenience. The Chooser is also gone. And instead of using control panels and the Control Strip to configure your Mac, you'll have to get used to visiting the System Preferences application.

A New OS On the whole, Mac OS X behaves pretty much like Mac OS 9, so you shouldn't have too much trouble finding your way around. Here's a quick visual guide to some of the biggest changes in OS X. Go to www.macworld.com/2001/06/features/OSX_slide.html for the complete tour.

A The Apple Menu Reborn OS X reinvents the Apple menu by combining the functions from OS 9's Special menu and the old Location Manager control panel, and adding access to recently used documents and applications and a few new features. Shortcuts to System Preferences and Dock settings are here, as is OS X's Log Out function. Also in the menu is an enhanced Force Quit feature.

B Preferential Treatment OS X replaces the Mac's control panels with a System Preferences application. The settings you can customize here are familiar, with a new Aqua look. Unfortunately, there's no way to get to most of the individual preference-setting panes without first opening the System Preferences application. The one-click convenience of OS 9's Control Strip—for adjusting your Mac's volume level, for example—is gone.

C Dock Basics The Dock is OS X's control center. You can drag application icons, documents, folders, and disk icons to the Dock, and it's where open windows in OS X–native applications go when you minimize them. You can hide the dock, but you can't turn it off completely.

D Left Dock The left side of the Dock is the functional equivalent of OS 9's Application menu. Active applications appear on the dock automatically, but if you drag an application's icon there manually, it will remain on display whether the program is running or not.

E Home Sweet Home Another new concept in OS X is the Home folder. Each user has his or her own. What's there? A bunch of other folders, where savvy OS X–native applications, presumably, will automatically store your pictures and the like. To get to it, click on the Home icon in the Dock or the Home button in a Finder-window tool bar, or select Home from the Go menu.

F Right Dock Disks, folders, files, and URLs live on the right side of the Dock. You can drag icons representing any of these to the Dock to make them readily available. This is also where minimized windows appear (only from within OS X–native applications).

G Dock Menus Hold your mouse button down on a folder or disk icon in the Dock, and up pops a hierarchical menu that lets you navigate easily to any document or subfolder therein. This feature is handy for opening documents. But you can't move or copy a file to a specific location by dragging it to a disk icon and drilling down to a folder.

H Same As It Ever Was—Sort Of When you boot up OS X, all connected hard disk drives and inserted removable media appear on your Mac's desktop. However, OS X's desktop icons are not "spring-loaded."

I The Missing Menu Wondering what the menu-bar clock is doing where the Application menu ought to be? There *is* no Application menu in OS X. Its functions have been split between the Dock and the individual application menus that now accompany all OS X–native programs.

J Look before You Leap In Column view, when you select an application or file icon, its preview image appears in the Finder-window column to the right.

K A New View You can display Finder windows in three ways. Two options—List view and Icon view—are the same as in OS 9. But in place of OS 9's Button view is a new Column view, which lets you navigate a disk's folder structure horizontally. (For example, you can click on a folder in the left-hand column to peruse its contents in the right-hand column.)

L On the Go The Go menu is new to the Finder. Its job is to give you quick access to places where Apple thinks you might want to go, such as your Home folder or your iDisk. Use it also to make a speedy hop to recently used folders (though access to recently used applications and documents is in the Apple menu—go figure). And the Go menu is where you come for access to a network file server.

M The Finder's New Menus One of the most striking changes in OS X is its reworked menus. You'll need to adjust to the new locations of often-used menu commands, especially in the Finder. And remember to check the Finder's revised keystroke shortcuts. For example, ⌘-M now minimizes a window instead of creating an alias. (The keystroke for creating an alias is now ⌘-L). And ⌘-N, which since early Mac times has been used to create a new folder within a Finder window, now opens a new Finder window instead. (To create a new folder, you now type ⌘-shift-N.)

OS X?

tions running in the Classic environment—we had no OS X–native applications to test it with—but our Visioneer Strobe Pro NT didn't.

We were able to get three FireWire camcorders—a Sony DCR-TRV320, a Sony DCR-TRV11, and a Canon Elura—to work with the newly released OS X–native version of iMovie. They wouldn't work with Final Cut Pro running in Classic (Apple does warn that Final Cut Pro isn't supported by Classic).

Other consequences of the driver problem may not be evident at first. For example, you can't run Retrospect Backup in Mac OS X. Before you perform a backup, you need to reboot your Mac in OS 9.1: no Mac OS X–native drivers are available yet for the dozens of different devices used during backup operations. (Retrospect does have a Mac OS X *client*, so over a network, you can back up Macs running OS X if the backup process is controlled from a Mac running OS 9.)

What It All Means to You

Here's how these limitations might affect some typical Mac users.

User Type 1: The Creative Professional Graphics professionals will certainly appreciate the stability of OS X, but only when the applications they use are available in OS X–native versions.

The two most important applications in desktop publishing are QuarkXPress and Adobe Photoshop. Quark has given a sneak peek at an OS X–native version of XPress but hasn't said when it will be available. Adobe has been even more secretive: the company showed Photoshop running under OS X very early in the new operating system's development cycle. But now it will say only that the next major release of Photoshop will be OS X–native—no word on when that program will ship. Adobe's position is similar for Illustrator, InDesign, GoLive, and AfterEffects.

Then there's the scanner problem. If you want to get traditional paper photographs into a page layout, either for print or for the Web, you need a scanner. But a scanner requires a scanner driver: while some USB scanners' drivers appear to work in the Classic environment, SCSI scanners need native OS X drivers to work with applications running in OS X and in Classic.

Many graphics professionals use AppleScript to automate their workflow, and they could have problems moving their scripts to OS X. AppleScript works for applications

A Perfect 10?

We tested seven Macs to see if they performed tasks faster when running Mac OS 9.1 or when running Mac OS X. We tested applications that ran in OS X and applications that ran in OS X's Classic environment. Tasks performed in Classic almost invariably took more time than equivalent tasks in OS 9.1, and even with native applications, OS X often showed little speed advantage. One clear exception was scrolling through a PDF document: PDF is OS X's native graphic format.

Best results in bold.
Shorter is better.

	OPEN MULTIPLE FOLDERS	SCROLL PDF	FTP DOWN-LOAD	CINEMA 4D XL (6.209)	iTUNES	iMOVIE	EXCEL CALCULA-TION*	ADOBE PHOTOSHOP 6.0.1*			
								Gaussian Blur 10	Unsharp Mask 2.3	RGB to CMYK	Lighting Effects
Apple iMac 233 (revision B); OS 9.1	25	100	34	31:50	3:35	5:09	108	60	61	74	77
Apple iMac 233 (revision B); OS X	62	48	59	38:01	7:07	7:21	311	57	58	79	82
Apple Power Mac G3/300 (beige); OS 9.1	25	82	139	24:23	4:27	3:58	100	22	23	46	35
Apple Power Mac G3/300 (beige); OS X	52	41	92	28:15	5:10	5:19	239	31	27	65	37
Apple PowerBook G3/400 (Pismo); OS 9.1	23	54	33	19:10	3:54	2:35	65	17	18	36	26
Apple PowerBook G3/400 (Pismo); OS X	37	25	39	22:47	4:04	4:15	194	21	19	43	28
Apple PowerBook G4/400; OS 9.1	22	53	33	17:20	2:35	2:25	61	7	10	36	9
Apple PowerBook G4/400; OS X	30	21	45	17:30	2:43	3:32	182	12	9	40	10
Apple Power Mac G4/533; OS 9.1	19	38	34	12:39	2:01	1:56	37	5	7	26	7
Apple Power Mac G4/533; OS X	22	**15**	31	12:56	1:58	2:32	137	8	7	28	7
Apple Power Mac G4/533 DP; OS 9.1	19	37	33	**6:16**	1:50	1:54	38	**3**	5	25	**4**
Apple Power Mac G4/533 DP; OS X	21	**15**	34	6:35	1:29	2:22	133	**3**	**3**	30	5
Apple Power Mac G4/733; OS 9.1	**18**	32	33	10:15	**1:23**	**1:37**	**36**	5	6	**15**	6
Apple Power Mac G4/733; OS X	19	**15**	**29**	10:15	1:36	2:16	116	9	10	20	6
	Better	Better	Better	Better	Better	Better	Better	Better	Better	Better	Better

Scores are in seconds. Cinema 4D XL, iTunes, and iMovie scores are in minutes:seconds. We tested each system with Mac OS 9.1 on one partition and Mac OS X on another, 256MB of RAM, a default system-disk cache, and virtual memory disabled (in OS 9.1). We set displays to 1024-by-768-pixel resolution and 24-bit color. For the PDF scroll test, we used Adobe Acrobat in Mac OS 9.1 and the Preview application in OS X. Photoshop tasks involved a 50MB file. In OS 9.1, we set Photoshop's memory partition to 150MB and History to Minimum. With Cinema 4D XL's memory partition set to 80MB in OS 9.1, we rendered a model at a resolution of 640 by 480 pixels with oversampling set to 4 by 4. We tested MP3 encoding with an audio-CD track that was 9 minutes and 25 seconds long and converted it using the 128-Kbps setting in iTunes 1.1. We exported a 240MB clip to a small QuickTime file with iMovie.—**Macworld Lab testing by Ulyssis Bravo and Macworld Lab staff**

** We performed these tests in Mac OS X's Classic environment.*

running in OS X or Classic. The OS X Finder, however, is not as scriptable as the OS 9 Finder, so scripts that invoke Finder functions may break under OS X.

Suppose you're designing only Web pages—doing no prepress work—and that you use Macromedia's Dreamweaver and either Fireworks or Adobe ImageReady. All of these programs will run under Classic, but neither Adobe nor Macromedia has announced dates for delivering OS X–native versions.

For all creative professionals, the hidden demon of OS X is fonts. Those available to your OS X–native applications are the ones installed in your OS X System folder, while the fonts available to applications running in Classic are installed in your OS 9.1 System folder.

These two folders are completely independent of each other. From Classic, programs can't see the fonts you have installed in OS X, and OS X–native programs don't know what fonts you have installed in OS 9.1. If you want a font to be available in OS X *and* its Classic environment, you must install it twice.

The Verdict If you earn your keep churning out graphics and designs, whether for print, video, or the Web, there's no good reason to move to OS X yet. In fact, when it comes to just about anything you need—applications, scanner or camcorder support, AppleScripted workflow, fonts—OS X will bite you. Your livelihood depends on your Mac. It's working fine with OS 9, so stick with it for now.

User Type 2: The Small-Business Owner If you own a small business, you probably use applications such as Microsoft Office, MYOB AccountEdge, FileMaker, and Power On Software's Now Up-to-Date & Contact. Perhaps your Mac doubles as a fax machine. How would you fare with OS X?

Microsoft has announced that Office won't be available for Mac OS X until fall. This means that if you spend a lot of time in Microsoft Word, Excel, Power Point, or Entourage, there's little to be gained by jumping to OS X. In fact, you might see performance decline.

MYOB is aggressively working on an OS X version of AccountEdge, which should be available by the time you read this. And FileMaker plans to have a native OS X version of FileMaker Pro out this spring.

Mac OS X comes bundled with a new Address Book application, which is integrated with the bundled Mail application and can be tapped by other OS X programs. If you're accustomed to Now Up-to-Date & Contact, however, you're in for a bit of a disappointment. Power On just released new versions that are not OS X native.

You may also be disappointed to learn that FaxSTF, the fax software that comes with modem-endowed Macs, doesn't work with OS X—not even in Classic. STF Technologies hopes to have an OS X version out by June, but the first release won't support faxing from Classic.

Does one of your customers require you to use a Windows application? If you solve that problem by running Virtual PC, mark your calendar for July. That's when Connectix plans to release an OS X–native version. Until then, Virtual PC won't work under Classic.

If you rely on speech-recognition software, be warned: neither IBM ViaVoice nor MacSpeech iListen work with OS X. IBM hopes to have ViaVoice ready for OS X soon, but MacSpeech hasn't announced any plans to deliver an OS X–native version of iListen.

The Verdict If you run your business on your Mac, the picture isn't much better for you than for the graphics professional. You can summarize your situation in two words: Microsoft Office. Wait till fall before even considering a move to OS X.

User Type 3: The Home User The least-demanding Mac users, home consumers may be the first for whom it makes sense to upgrade.

Apple has given us an OS X–native AppleWorks—it's a prerelease, or beta, version—and OS X versions of iTunes and iMovie. Casady & Greene announced plans for a beta version of SoundJam for Mac OS X. Add these to the preview version of Microsoft Internet Explorer that comes with OS X and Apple's built-in Mail and Image Capture applications, and you've got a tidy bundle of OS X–native programs.

On the downside, the lack of a compatible DVD-movie player may

continues

give some users pause. And if you've gotten used to burning CDs, OS X will be a step backward: that capability is also on the to-be-delivered list. Apple is working to resolve these shortcomings, and a fix should be along soon.

You can always boot into Mac OS 9 when you need to play movies or make CDs, but is switching back and forth between operating systems the ease-of-use Macintosh experience you're looking for? Probably not.

Games are another software category that may affect your decision. Games that run in Mac OS 9 should work fine in Classic, although third-party graphics-acceleration cards will need new drivers. Some companies are already shipping OS X versions of popular games: you can download an OS X–ready update to Cro-Mag Rally, from Pangea Software, for free, complete with a short list of known bugs. Gathering of Developers' Oni is out in a version that runs on either OS 9 or OS X. And Id Software is working on a Quake III Arena for OS X that should soon be available soon from the game's distributor, Activision. (The version released earlier by Omni Group works only with the OS X beta.)

The Verdict It may have been hard to imagine that home consumers would be first to switch to Apple's new Unix-based system. But the temptation should be resisted. You bought a Mac so you wouldn't have to worry about system configurations. You'll only give yourself headaches trying to live in the netherworld between OS 9 and OS X. Make a list of the software you use, and wait till it's all available in OS X–native versions.

User Type 4: The Mac Geek You know who you are. You've spent years becoming intimate with Mac OS's every nook and cranny. You supply technical support and advice to a vast network of people.

Applications may not be so important to you because knowing the operating system itself is your trade. Plus, booting between OS X and OS 9 wouldn't be difficult for you. You might also find it fascinating to experiment with the Unix applications OS X can run, such as Apache.

The Verdict You are the best candidate for an immediate switch to OS X. It's experimental, and you are someone who wants—and perhaps needs—to experiment. $129 is a reasonable investment in your career—and in a whole new frontier to explore. Just make sure to load OS X on one of your more powerful Macs so that the experience will be exciting instead of frustrating.

The Last Word

A year from now, when people talk about Mac OS, they'll mean Mac OS X. It's plainly a superior operating system. Apple has laid a strong foundation for the Mac's future.

But the transition will be slow. Apple has all but admitted that OS X isn't ready for prime time. If it were, the company would be installing it on Macs today instead of waiting.

The best time to upgrade to Mac OS X will be different for each Mac user. There's no risk in trying it (except your $129). To return to OS 9, just reboot. But until your hardware is fully supported and the applications you use most are available in OS X–native versions, you're probably better off biding your time. **m**

Contributing Editor HENRY BORTMAN has written about Mac OS for a long time and still has a fondness for 6.0.5.

When Should You Switch?

Save yourself a headache: don't switch over to Mac OS X too soon. Here are some pointers that will help you avoid making a premature transition.

Step 1: Check Your Hardware Mac OS X runs on any Apple Macintosh that shipped with an Apple-installed G3 or G4 processor. It isn't officially supported on clones (or on older Apple Mac models) that shipped with PowerPC 601, 603, or 604 processors and were later upgraded to a G3 or G4. Not surprisingly, OS X performs better on a G4 machine than on a G3. It is optimized to take advantage of the G4 processor's AltiVec instructions, for carrying out multiple computations at once.

And Apple recommends 128MB of RAM, but you'll probably want at least 256MB. Many supported Mac models shipped with only 64MB (or even 32MB) of RAM. They'll need upgrades.

Step 2: Check Your Applications If the programs you use day in and day out haven't yet been released in Mac OS X–native versions (most popular applications haven't), they won't reflect the best features OS X has to offer. They will run—at least, most of them will—but they'll run in what Apple calls "Classic" mode.

Applications run more slowly in Classic than in OS 9.1, so there's not much point in switching to OS X until most of the applications you normally use are available in OS X–native versions. When will that be? See "Applications: The Missing Link" for details.

Step 3: Check Your Drivers A driver is software that controls hardware: printers, disk drives, scanners, and the like. Apple provides some drivers with Mac OS X. Check hardware companies' Web sites regularly for updated drivers.

Step 4: Take a Deep Breath All these issues will be resolved in time. When they are, Mac OS X will still be there waiting for you. If you hold out until all the pieces are in place, your transition will go much more smoothly.

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the COLOR challenge

BY BRUCE FRASER / PHOTOGRAPHY BY STAN MUSILEK

Can Flat-Panel Displays Replace CRTs on Publishers' Desks?

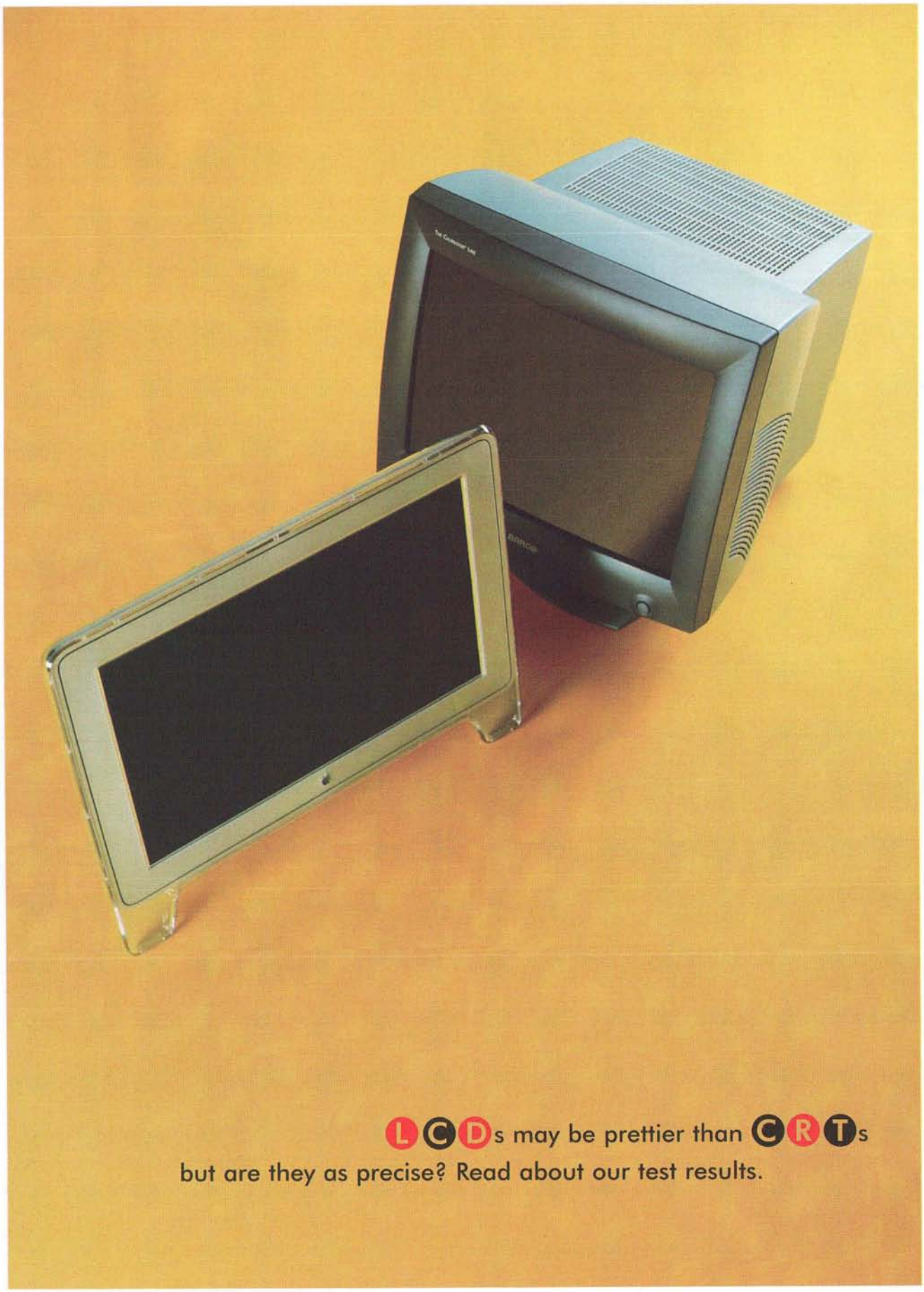
For several years, the sleek good looks of LCD monitors have been tempting Mac users away from clunky CRT displays. And LCDs have other advantages over traditional CRTs: they're flicker free, which can prevent eye fatigue; they're much brighter and can display a wider dynamic range; and their colors don't drift. And the average price of an LCD—formerly several times that of a CRT—is dropping.

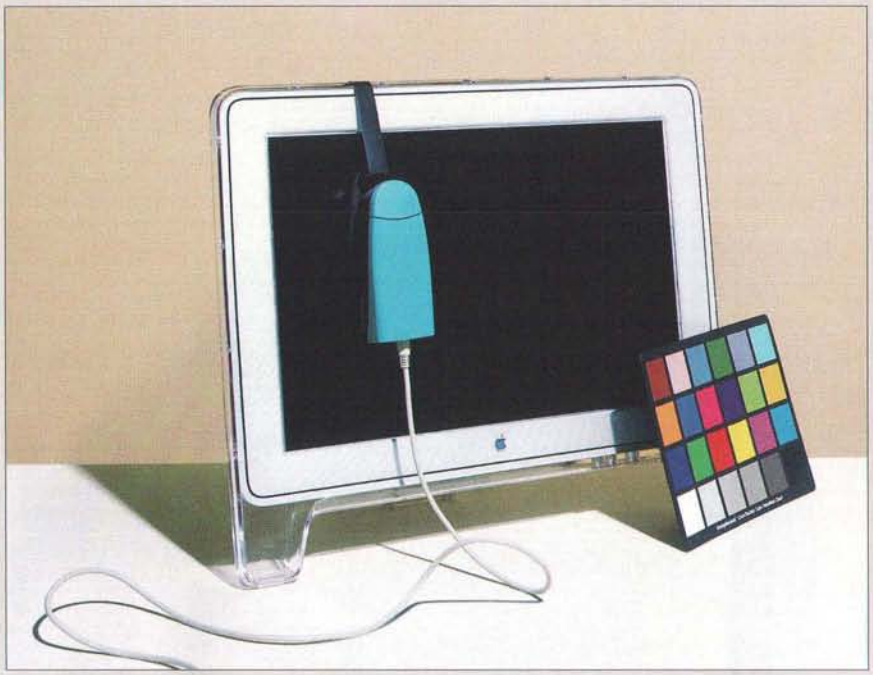
Some companies, including Apple and SGI, claim that their LCDs' brightness and stability make them ideal for the color-critical work of graphic designers, professional photographers, and high-end–scanner operators. These claims could not be tested until the recent arrival of LCD calibration and profiling tools. Armed with these tools, Macworld Lab and I cast a critical eye on three LCDs and two CRTs to determine which technology offered the most-accurate color.

The Contenders

We started with two 22-inch CRT monitors that come with calibration hardware and software: the $3,499 Personal Calibrator V, from Barco, and LaCie's $1,099 electron22blue with its $499

Macworld LAB TEST


LCDs may be prettier than CRTs
but are they as precise? Read about our test results.



The March of Progress

Until recently, it was impossible to accurately measure and calibrate LCDs such as the Apple Cinema Display.

CALIBRATING MONITORS

All monitors require calibration for accurate color-critical work, but some are easier to calibrate than others. As I calibrate, I set explicit target values for black and white luminance so the monitor's contrast ratio remains constant.

CRT Calibration Both Barco and LaCie offer one-button calibration, but there are important differences between their methods. The Barco Personal Calibrator V always aims for a white luminance of 75 cd/m^2, a low luminance that prolongs the life of the monitor and provides an acceptable contrast ratio in a low-light environment. The LaCie electron22blue lacks a means of specifying a white-luminance aim point; if you simply follow the on-screen instructions, which tell you to turn the contrast all the way up, you'll get a very bright display—for a while.

LCD Calibration Calibrating the LCD monitors is in some ways harder, in other ways easier, because they lack complex controls. The Apple Cinema Display has a single brightness control, which Gretag-Macbeth's ProfileMaker software tells you to turn all the way up. After calibration, the display is dimmer, but the blacks tend to wash out—the reduced brightness caused by calibration doesn't improve the blacks at all. SGI's Silicon Graphics 1600SW offers crude control over the backlight color temperature (the slider is labeled "Warmer" and "Cooler"). We dialed in our target 6,500-kelvin white point accurately using the Spectrolino and ProfileMaker. But again, the image suffered from washed-out blacks.

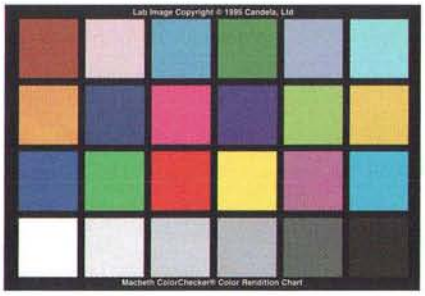
NEC's analog MultiSync LCD 1800 flat-panel monitor has a full complement of controls for brightness, contrast, color temperature, and black level; we used these to tweak the display until it was in as close to an ideal state as possible, a lengthy process that took about half an hour. But the monitor's lack of uniformity made the value of the whole exercise questionable.

color calibrator, blue eye. Of the three LCDs we tested, only the $2,999 Apple Cinema Display and SGI's $1,495 Silicon Graphics 1600SW are strictly digital monitors. (Some LCDs convert a computer's digital signal to analog current, which can result in visible distortion and a loss of sharpness. The digital signal drives the Apple and SGI displays we tested, thus avoiding these problems.) We also tested the $1,899 NEC MultiSync LCD 1800—not because NEC claims that it's similar to the Apple and SGI monitors we examined, but to see how an analog LCD would compare with digital models.

To judge the monitors' performance, we compiled the subjective opinions of a five-person jury and made extensive measurements (for the details of our testing methodology, see "How We Tested").

Tools of the Trade

Graphic designers and other professionals who need to make critical decisions about tone and color rely on well-calibrated displays. Calibration and profiling tools for CRT monitors, such as ColorVisions' $399 OptiCal and $224 PhotoCal (800/554-8688, www.colorcal.com), are mature and relatively inexpensive. But LCDs present some challenges. The suction-cup colorimeters designed to measure a CRT's color accuracy can rip the coating from the front of LCD screens. And the software routines for building CRT monitor profiles don't work well with LCDs.



Macbeth Color Checker You can use this reference card with 24 swatches to evaluate the accuracy of color reproduction.

Color-measurement giant GretagMacbeth (800/622-2384, www.gretagmacbeth.com) recently began selling a $200 harness that allows you to attach the company's $3,750 Spectrolino spectrophotometer to an LCD, and the company has updated its $3,500 ProfileMaker Pro software to include a calibration and profiling routine tailored to LCDs. When we did our testing, the harness was the only LCD-calibration option; however, in April of this year, the company announced the Eye-One Monitor, a $600 package that includes a measurement device and software; it creates profiles for LCDs and other monitors. (For more about calibration, see "Calibrating Monitors.")

So, in theory at least, we now have the means to replace bulky CRTs with slim LCDs, even when our bread and butter depends on accurate on-screen color.

Test Results: Color Me Critical

Some test results surprised us. Unlike CRT monitors, LCDs have always had problems with viewing angles—tone and color shift as you view a display from different angles. But the Apple Cinema Display had an impressively wide viewing-angle range, better than that of the Silicon Graphics

continues

By the Numbers

COMPANY	MONITOR	COMPANY'S ESTIMATED PRICE	CONTACT	UNIFORMITY	VIEWABLE AREA*
Apple Computer	Cinema Display (LCD)	$2,999	800/692-7753, www.apple.com	6.7 ΔE**	22.0
Barco	Personal Calibrator V (CRT)	$3,499	www.barco.com	3.0 ΔE**	21.0
LaCie	electron22blue (CRT)	$1,099 (blue eye color calibrator, $499)	503/844-4500, www.lacie.com	3.8 ΔE**	20.0
NEC Technologies	MultiSync LCD 1800 (LCD)	$1,899	888/632-6487, www.necmitsubishi.com	7.1 ΔE**	18.1
SGI	Silicon Graphics 1600SW (LCD)	$1,495	800/800-7441, www.sgi.com	7.4 ΔE**	17.3

* Measured diagonally, in inches. ** 1 ΔE is the smallest perceptible color difference. Lower scores are better.

1600SW and much better than that of the MultiSync LCD 1800.

I Love a Monitor in Uniform The Cinema Display didn't fare so well in display uniformity. In fact, for all three LCDs, our jurors' eyes and our spectrophotometer told the same story: the displays' screens lacked uniformity and had obvious light and dark spots. This lack of uniformity has a direct impact on a display's accuracy because the same color looks different depending on its location on the monitor. Both CRT monitors had excellent uniformity.

When we used a GretagMacbeth Spectrolino to take a set of nine readings across the monitors' faces, we found that the Personal Calibrator V had the best uniformity, followed by the electron22blue, with a maximum ΔE of 3 and 3.8, respectively (1 ΔE is the smallest perceptible color difference, 3 ΔE is a strict goal for profile accuracy, and 6 ΔE is usually considered a good commercial match in the print trade). The Cinema Display had a ΔE of 6.7, followed by the NEC MultiSync LCD 1800, which had a ΔE of 7.1. The Silicon Graphics 1600SW had the worst uniformity, with a ΔE of 7.4.

These results point to a flaw in LCD technology. All the light produced by an LCD comes from the backlight—the LCD elements simply act as color filters. It's hard to illuminate an LCD evenly, and the bigger the display, the more difficult it is. Apple deserves kudos for making the Cinema Display as good as it is, but its uniformity still falls short.

Test Results: Color Accuracy

We gauged the monitors' color-display accuracy with a Macbeth Color Checker, a color target from GretagMacbeth with a grid of 24 color swatches (see "Macbeth Color Checker"). Jurors compared the physical target in a light box with the on-screen display of the same target.

The LCDs reproduced the yellow swatch (row 3, column 4) from the Color Checker better than the CRT monitors (which gave it an orange tinge), but for almost all other colors, our jury felt that the CRT monitors were more faithful to the original. They pointed out that the blacks on the LCDs were washed out compared with both the CRT blacks and the physical target, and that the tracking of the gray patches (row 4) was much better on the CRTs.

The jury unanimously picked the Barco monitor as the most accurate, followed by the LaCie (though a lone dissenter placed the Apple display second). The Apple display came in third, followed closely by the NEC (one juror said it looked just as good

HOW WE TESTED

For our tests, we measured a Macbeth Color Checker (a physical target sold by GretagMacbeth, available at any good camera store) and scanned it into Adobe Photoshop 6, defining the color swatches in Lab mode using the measurement data. Defining the target in Lab mode ensured that the monitor profile would be the only one to affect the conversion from Lab data to monitor RGB. That let us compare the displayed color on the monitor with the physical target, knowing that the monitor profile was the only thing influencing the display of color.

We calibrated all the monitors to a white point of 6,500 kelvins and a gamma of 2.2. For both of the CRT monitors, we used the vendor-supplied calibration and profiling tools. For the LCDs, we used GretagMacbeth's Spectrolino spectrophotometer and ProfileMaker Pro 3.1.4 software.

We loaded the resulting display profiles and displayed the Lab file in Photoshop. We measured each color swatch on each monitor using the Spectrolino and compared the swatch measurements with the Lab-mode values in the Photoshop image. We displayed the physical Color Checker target in a calibrated light box, and we then asked our jury to compare the on-screen display with the physical target.

Thin Isn't In The Apple Cinema Display (left) meets the Barco Personal Calibrator V.

as the Apple), with the SGI monitor coming in dead last.

Claim Jumping

Apple and SGI claim that their LCDs particularly suit color-critical work. Both companies say their LCDs are much brighter than CRTs and hence have a wider dynamic range (the range from black to white). This was certainly true of the Apple and SGI LCDs in their raw, uncalibrated state: the Cinema Display achieved a white luminance of around 180 candelas per square meter (cd/m²), while the smaller Silicon Graphics 1600SW put out in excess of 200 cd/m². In comparison, the uncalibrated LaCie display had a white luminance of 158 cd/m². Barco monitors are calibrated at the factory to a conservative 75 cd/m² so they can maintain calibration aim points for three years.

Calibration always reduces the brightness of any monitor from what it is in its raw state. After calibrating the LCDs with the Spectrolino, we noticed a dramatic decrease in brightness: 108 cd/m² for the Apple display and 98 cd/m² for the SGI. We achieved a calibrated white luminosity of 103 cd/m² on the LaCie with plenty of headroom; however, we wonder how long it could maintain that target luminance. When you also factor in the relatively weak blacks of the LCD monitors, the contrast range in their calibrated state differs little from that a good CRT's.

Resolution Differences Apple and SGI also point to the 1,600-by-1,024-pixel resolution of their LCD monitors as superior to a CRT's resolution. We ran both CRT monitors at a resolution of 1,600 by 1,200, which displays approximately 15 percent more pixels than the LCDs do, and didn't see any unacceptable softness or other display artifacts.

The Last Word

I can't recommend any of the LCD monitors we looked at for color-critical work because their test results were relatively poor. But even if they had tested well, the cost of LCD monitors would make them a poor choice for many graphics professionals.

CRTs are far from ideal. Most of us would love to have a stable, flicker-free display that took up little space on our desks and was light enough to lift with one hand. But until the uniformity of LCDs starts to approach, if not equal, that of CRT monitors, graphics professionals shouldn't say goodbye to the devil they know. **m**

BRUCE FRASER is a coauthor of *Real World Photoshop 6* (Peachpit Press, 2001). He soft-proofed the book on his Barco CRT monitor.

More Info: www.macworld.com/2001/03/07/reviews/calibrators.html

Read about the best inexpensive CRT-calibration tools in this review.

LINK

OLD MAC NEW TRICKS

GET THAT MAC OUT OF THE ATTIC AND BACK TO WORK

BY FRANKLIN N. TESSLER

Remember that old Power Mac 7500 you banished to the attic when you bought your speedy new G4 last year? Granted, it's not the lightning-fast Windows killer it used to be, but that doesn't mean it's ready for the junk pile. If you find the right job for it, you can still get plenty of use out of your old Mac friend, often with only a small investment in hardware, software, or both.

During the Mac's 17-year history, Apple and its erstwhile partners Power Computing, Motorola, and Umax have sold hundreds of models and variations; finding resources for aging computers can be like locating parts for a 1956 Chevy. In our "Old Mac, New Tricks" series, we'll be showing you how to convert older Macs into useful members of your

ILLUSTRATION BY DAN WINTERS AND GARY TANHAUSER

OTHER ARTICLES IN THIS SECTION

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Infographics communicate facts and figures with flair.

52 **Foolproof PDFs**
Create a PDF file that displays and prints exactly like your original.

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Link FileMaker fields for greater accuracy and easier updating.

61 **Mac 911**
Reclaim disk space, burn a CD, and print without wires.

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D E F I N E

business or household as MP3 jukeboxes, Web servers, and more. (In fact, our guide to using an older Mac to back up the computers on your network is available now at Macworld.com: see "Case Study: Making a Backup Server.") In this, the first installment of our series, we'll discuss what you need to do *before* you try to make your aging Mac perform new tricks, and we'll tell you where to find the software and hardware you're likely to need. In future "Old Mac, New Tricks" features, we'll propose specific uses for older Macs and show you how to outfit them for their new roles.

THE WAY IT WAS

POWERBOOK 170
October 1991
The PowerBook debuts. Like the original Macintosh, the first PowerBooks offer few expansion options.

POWER MACINTOSH 6100, 7100, 8100
April 1994
The PowerPC processor is introduced. Even these early models can be upgraded with third-party G3 and G4 boards.

POWER MACINTOSH 7500
August 1995
NuBus is replaced by PCI bus, opening the Mac to industry-standard expansion boards. A replaceable CPU daughterboard simplifies installing faster processors.

STEP 1

MAKE REPAIRS

Your retired Mac may need to be revived before it can be put to work, and there are several places to which you can turn for help. You can get replacements for missing or damaged accessories from specialty vendors such as Sun Remarketing (800/821-3221, www.sunrem.com), Shreve Systems (800/227-3971, www.shrevesystems.com), MacTreasures (408/227-1645, www.mactreasures.com), and AllMac.com (800/933-4962, www.allmac.com).

If your Mac exhibits any unusual behavior, such as distorted video or frequent crashes, a bit of troubleshooting is in order. Ted Landau's book *Sad Macs, Bombs, and Other Disasters* (Peachpit Press, 2000) is an excellent resource when you need to find out what's ailing your Mac. A computer that doesn't boot at all may be suffering from something as simple as a dead battery or as serious as a burned-out component on the logic board. Replacing the battery in most Mac models is relatively straightforward—the Macintosh Battery Web Page (www.academ.com/info/macintosh) gives specifications and installation instructions for many older models and clones.

If you can't repair the problem yourself, you should probably seek the advice of a certified Apple technician. For a fee, most service centers will provide an estimate of what repairing your Mac will cost. You can find an authorized facility in your local yellow pages or on Apple's Web site (www.info.apple.com/support/applecare_products/service).

STEP 2

DECIDE HOW TO USE IT

As you might expect, the most economical way to put an old Mac to work is to use it "as is" (see "Easy Ways to Renew an Old Mac"). If you can't think of a use for your unmodified Mac, you may be able to extend its capabilities by adding software or hardware. But before you add anything to your Mac, make sure that you know its specifications—especially the processor's speed and model and the types of ports and slots—which will determine what upgrades and peripherals the computer can support and what types of new jobs it can do.

To find out what's inside your Mac, consult the Apple Spec database (www.info.apple.com/applespec/applespec.taf), an online catalog that lists hardware details and release dates for every Macintosh system ever shipped by Apple. The Low End Mac Web site (www.lowendmac.com) provides similar information for many Mac clones. Also be sure to check the first item in the Finder's Apple menu (About This Computer or About This Macintosh, depending on your system software version) to see how much memory is installed in your Mac.

Software upgrades for old Macs are usually painless and relatively

WOULD-BE TINKERERS WERE FRUSTRATED BY THE CLOSED DESIGN AND LIMITED UPGRADE POTENTIAL OF EARLY MACS. THANKFULLY, THAT'S CHANGED.

MACINTOSH POWERBOOK 3400

February 1997

The first PowerBook with an expansion bay, this model accepts extra batteries and storage devices.

POWER MACINTOSH G3

November 1997

The G3 processor is introduced. This Mac also has an IDE bus, which makes hard-drive upgrades less expensive.

iMAC

May 1998

Apple gets rid of ADB ports in favor of USB ports, which accept popular printers, input devices, and other add-ons.

POWER MACINTOSH G3 (BLUE AND WHITE)

January 1999

FireWire ports let the Mac work with compatible digital-video recorders and storage devices.

inexpensive. Alas, deciding whether to upgrade your hardware isn't usually as straightforward. Although there's no foolproof formula that can tell you whether investing in add-on hardware is worth the cost, some basic math will help you decide if it makes sense to put money into an old computer.

If you're still at a loss about what to do with a retired but functional Mac, consider donating it to a school or a nonprofit organization. Often you can deduct the computer's fair-market value on your tax return. For $10, you can get an estimate of your Mac's worth online at the American Computer Exchange (www.amcoex.com). The National Recycling Coalition Web site (www.nrc-recycle.org) has information about recycling or donating old computers.

STEP 3

FIND THE RIGHT SOFTWARE

Often, you'll have to add or update your old Mac's software to prepare the computer for a new role. If you're missing any applications, you'll need to find compatible replacements—and you'll want to at least consider updating your computer's system software.

Find Compatible Applications

Locating software that runs on older Macs is easier and less expensive than you might expect. Some vendors offer limited versions of current applications that are compatible with old models. For example, Nisus Software's free Nisus Compact (800/890-3030, www.nisus.com) runs under System 6 or later and uses only 512K of memory. Don't forget, you can also find older software versions through online search engines, by browsing on auction sites such as eBay (www.ebay.com), or by scavenging at your local Apple store or computer swap meet.

SMALL INVESTMENTS CAN MEAN BIG RESULTS

Upgrade Your System Software

New Mac OS releases usually incorporate bug fixes and extra features, so you should consider upgrading to a later system software version than the one that originally shipped with your computer. Even the Macintosh 128K supports System 6, so you'll usually be able to choose from System 6 through 9.

Consult the Apple Spec database to see which Mac OS versions your Mac supports. The database doesn't always list the most-recent compatible version, so also check Apple's technical-support site (www.apple.com/support) to get the hardware requirements for any system software release you're considering.

Next, find out which system software versions work with the programs you'll be running on your Mac. (You can usually find this information in the application's manual or in a Read Me file on the installer disk.) As a general rule, it's better to choose a recent Mac OS version, but keep in

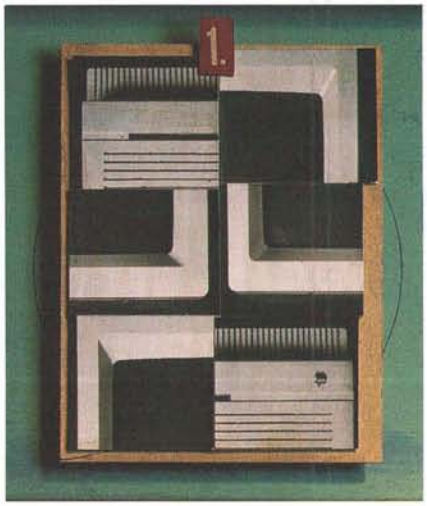
continues

mind that newer software releases usually make more demands on RAM, hard drives, and processors. The fabulous features of a newer OS may not benefit you if your Mac slows to a crawl. If you don't need the features in the most recent system software version compatible with your Mac, upgrade to an earlier version instead.

If your old Mac isn't all that old, you may want to buy Mac OS 9 on CD-ROM; it costs about $100 and is available from Apple, third-party resellers, or your local computer store. Interim updates are generally available for free on Apple's support Web site (ftp://ftp.apple.com/Apple_Support_Area/Apple_Software_Updates), where you'll also find free System 6 and 7 downloads. Apple no longer sells or provides Mac OS 8.

Update Your Applications Macs of relatively recent vintage—released within the past five years or so—may be compatible with the latest versions of application software. As with system software upgrades, however, extra features can take their toll on performance, so jumping to the latest version usually doesn't make sense for older Macs. A prime example of this is Microsoft Word 5.1. It doesn't sport all the whiz-bang features of Word 2001, but it may be the best choice for your system if all you need is a functional word processor. However, be aware that older versions of software may not be able to read files created by newer versions. For instance, if you have Microsoft PowerPoint 4 installed, you won't be able to read PowerPoint 98 files. And keep in mind that PowerPC-only applications won't run on machines with 680X0 processors.

If you have a modem, even an older Mac will get you online. For example, the iCab Web browser needs only 4MB of free memory and runs on any 68020-based Mac with System 7.0.1 or later. You can download the latest public beta from iCab's Web site (www.iCab.de). Fetch 3.0.1, a popular FTP client ($25); ZTerm 1.0.1, a simple terminal



emulator ($30); and Eudora 4.3, a free e-mail client, work on 680X0-based models from the Mac Plus on up. Find the first two at the Mac-download Web site (www.zdnet.com/downloads/mac/download.html) and the third at Eudora's Web site (www.eudora.com/products/old.html).

You can stay on top of software updates by consulting VersionTracker (www.versiontracker.com), a Web site that keeps tabs on Mac software releases from thousands of companies. If you can't decide whether to get an updated version of a program, pay a visit to the company's Web site to get a detailed description of new features, bug fixes, lists of minimum system requirements, and free demos.

STEP 4

INVEST IN NEW HARDWARE

Modest hardware upgrades often pay off by allowing you to use software that you couldn't even consider before. For example, for less than $100 you can boost your iMac's memory from 64MB to 128MB, which lets you use memory-hungry applications such as PowerPoint.

The first Macs weren't designed for upgrades—transforming a Mac 128K into a 512K "Fat Mac" required a trip to an Apple dealer and almost $1,000. Happily, newer Macs are far more upgrade-friendly, and installing most hardware enhancements is now well within the capabilities of most users. (For more information, see "The Way It Was," which illustrates important changes to Mac hardware, with an emphasis on features that made upgrades easier to perform.)

Add Memory Adding RAM is usually the most cost-effective way to make an old Mac more capable. And fortunately, RAM prices have been falling. You can check out the asking price of memory chips for PowerPC Macs on the MRP RAM-Watch page (www.macresource.com/mrp/ramwatch.shtml) or at ramseeker (www.ramseeker.com). Online vendor MacResQ (888/447-3728, www.macresq.com) stocks a variety of memory modules for old systems, including 680X0-based

LINKS

More Info: www.macworld.com/2001/04/13/howto/backup.html	More Info: www.macworld.com/subject/oldmac/worksheet.html	More Info: www.macworld.com/subject/oldmac
Find out how to use an older Mac as a backup server.	Does it pay to refurbish an old Mac? Use our worksheet to do the math.	No time to type in URLs? Get a complete list of the links mentioned in this article.

Macs, but RAM for some models, such as the Mac IIfx, may be hard to locate.

Get a New Hard Drive Adding a higher-capacity hard drive is another good way to enhance the capabilities of an older Mac. Every Macintosh model from the Mac Plus through the iMac sported a SCSI port that accepted external drives. If you shop around, you can find external 2GB SCSI drives for as little as $100. Many Macs are also compatible with less-expensive internal IDE and SCSI drives, which don't require a separate power supply.

Upgrade the Processor CPU upgrades are a viable option for many models, even those without replaceable processor cards. Though you'll pay $800 or more for the fastest G4 boards, XLR8 (770/564-5682, www.xlr8.com), PowerLogix (877/849-2504, www.powerlogix.com), and Sonnet Technologies (800/786-6260, www.sonnettech.com) sell less-expensive upgrades for desktop Macs, clones, and PowerBooks. For about $400, for example, you can swap the 100MHz PowerPC processor in your Power Mac 7500 for a speedy 400MHz G3 and run the latest version of Adobe Photoshop. Before you buy, check the Accelerate Your Mac Web site (www.xlr8yourmac.com), which includes a searchable database of user reviews of CPU upgrades, along with hundreds of useful tips and answers to common questions.

If you're planning on running Mac OS X, be aware that Apple hasn't promised to support Macs upgraded with third-party G3 or G4 processor cards, although some vendors have claimed that their upgrades will be compatible with the new OS.

Add Features Add-on boards offer the greatest potential for enhancing the capabilities of old Macs. Depending on the model, options range from adding Ethernet networking to providing USB ports for using input devices that aren't compatible with ADB Macs. To determine what type of cards your computer accepts, find your model in the Apple Spec database and look under the Logic Board section. Most add-on

continues

EASY WAYS TO RENEW AN OLD MAC

Finding a role for an old Mac without adding hardware isn't as challenging as you might imagine. Here are some ideas to help get you started. And we'd like to hear your suggestions; please visit Macworld.com and post your ideas in the Old Mac forum (type Old Mac forum in the Search box).

New Master

Although your old Mac may no longer have enough horsepower for you, it's probably more than adequate for someone in your home, office, or organization who doesn't already have a computer. For example, a Mac IIci running ClarisWorks 3.0 is a good option for temporary workers who need to do simple word processing. (You can buy old versions of ClarisWorks from many of the online resellers mentioned in Step 1.) If your school-age kids are constantly clamoring for time on your Mac, get them out of your hair by giving them an older computer for doing homework assignments or playing games.

Specialized Tasks

Old Macs can also do a variety of unattended jobs. For example, Vicomsoft's SurfDoubler ($50; 800/818-4266, www.vicomsoft.com), which runs on any PowerPC Mac with System 7.6.1 or later, lets you share an Internet connection between two computers. (For details on using SurfDoubler, see "Simultaneous Surfing," *How-to*, September 2000.) You can turn any PowerPC model into an office message center with Smith Micro's HotFax MessageCenter Pro ($70; 816/554-8565, www.smithmicro.com). Even if you have a 68030 Mac with a slow modem, you can use it for sending and receiving faxes.

Old Macs—including some 680X0 models such as the Centris—make excellent Web servers, as long as you don't expect them to handle thousands of hits. And, if your computer is compatible with Mac OS 7.5.3 or later, you can use Apple's Personal Web Sharing to serve Web pages on the Internet or a corporate intranet from a folder on your hard drive.

You can also turn an old Mac into an MP3 jukebox by downloading Casady & Greene's free SoundJam MP (800/359-4920, www.casadyg.com), which runs on any Mac using OS 8.1 or later with a chip no older than PowerPC 603. A 1GB hard drive has room for hundreds of songs, and SoundJam lets you create customized playlists. If your computer has built-in USB ports and you're running OS 9.0.4 or 9.1, Apple's iTunes is another free option.

boards come with instructions and are a snap to install. Because they work on both PCs and Macs, PCI cards are usually plentiful and relatively inexpensive. Boards for older, NuBus-based Macs such as the Quadra series are harder to come by, but you may be able to get them from companies that specialize in Mac replacement parts.

Add Peripherals You can often get printers, modems, and other peripherals for older Macs from vendors that specialize in Mac replacement parts. If you don't need a color printer, you can find refurbished Apple LaserWriters, a good choice for pre-USB Macs, for as little as $150. Pre-USB Macs with PCI slots can be expanded with Keyspan's $40 USB Card (www.keyspan.com), which adds twin USB ports to let you use the latest inexpensive ink-jet printers. (Before you buy, check the printer vendor's Web site to see which versions of the Mac system software the printer driver requires.)

Change Your PowerBook PowerBook users enjoy fewer upgrade options than owners of desktop Macs, but you can still buy higher-capacity hard drives for many older models. You can also find CPU upgrades for relatively recent PowerBooks such as the 1400 and early G3 models.

The Last Word

An older Mac has plenty to offer, whether you want to use it for surfing the Web, writing newsletters, or crunching spreadsheets. If you know where to look for resources, you can coax years of extra life from your old Mac. **m**

At last count, *Macworld* Contributing Editor FRANKLIN N. TESSLER had owned ten Macs since 1984. All but three of them are still in use at home or work.

CASE STUDY: MAKING A BACKUP SERVER

No computer runs perfectly forever, and we know we should make copies of our precious data. But our Macs work hard—even when we have multiple computers, it seems as though there's never enough time to take one off-line for backup purposes.

The solution could be as near as the retired Mac moldering in your basement. For example, many of us bought Power Mac 7500s. After six years, yours is probably showing its age, but with the proper software and external storage device, it can be rededicated as a backup server—coordinating when and how a network full of data is backed up. The cash outlay required for this can be surprisingly small.

You can start with Dantz's Retrospect Desktop and Retrospect Clients 5-Pack (925/253-3000, www.dantz.com). Retrospect backs up Macs across an AppleTalk network and backs up Macs and PCs over a TCP/IP network. Retrospect offers flexible scheduling options and supports just about any storage medium on the planet (including Web-based storage).

Of course, your 7500 and Retrospect can't do the job alone. You also need a backup medium. There are several options, including pricey high-capacity storage devices such as tape drives and DVD-RAM, and midrange CD-RW drives and removable-cartridge media.

If you want reliability at a relatively low price, go with a CD-RW drive. Just be aware that if you back up files that run into multiple gigabytes, you'll have to be around to swap disks—a pain if you hope to back up your network during the few hours that your Macs are not in use.

Depending on your financial situation and backup needs, you may want to consider other extras: A fast SCSI or FireWire card in your Mac will move data more quickly to the storage device. And if you really need speed, adding a 10BaseT Ethernet card to your backup server, along with a processor upgrade, will cut your backup times in half.

For complete instructions on turning *your* old Mac into a trusty backup server that fits your needs, visit www.macworld.com/2001/04/13/howto/backup.html.—CHRISTOPHER BREEN

LOW-COST BACKUP SERVER BREAKDOWN

Your old Mac	free
CD-RW drive	about $200
CD-RW media (100 disks from Costco)	about $45
Dantz Retrospect Desktop	$175
Dantz Retrospect Clients 5-Pack	$120
Total	$540

I'd heard a lot of buzz about ATI's new RADEON™ MAC EDITION, its stunning 3D acceleration, 32MB DDR graphics memory and flexible display support. I wondered, would this graphics accelerator really make designing easier and faster? Wow! It didn't take long to find out. RADEON™ MAC EDITION rendered the most complex 3D elements faster than I'd ever seen; even when working in 32-bit true color! My projects literally sprang to life with incredible detail and realism. But RADEON™ MAC EDITION isn't all work and no play. The 3D gaming – on my lunch break of course, is just as incredible with noticeably faster frame rates. With the fastest rendering speeds available, animations are fluid and life-like. Plus, I can hook up a TV for a big-screen experience. 3D rendering performance, awesome gaming, and display flexibility make RADEON™ MAC EDITION one wicked card!

Gimme Radeon!

RADEON™ MAC EDITION is "...our top pick in 3-D graphics cards."

-MacWorld.com, January 24, 2001

32MB PCI & AGP

Macworld

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CATHY ABES

Bring Data to Life

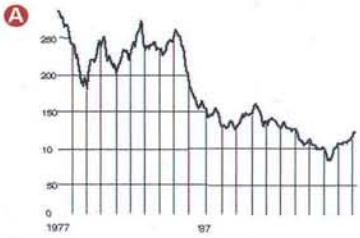
Art and Information Can Complement Each Other

When you think of a chart, *artistic expression* usually doesn't jump to mind: you may picture simple jagged lines on horizontal and vertical axes, or colored pie slices. But Rod Little's informational graphics, which liven up the pages of *U.S. News & World Report,* present statistical data in a new light. Rod looks for unusual ways to weave images around static numbers, transforming them into visually arresting tableaux.

To illustrate two related line graphs comparing the U.S. economy with Japan's, Rod conjured up stylized sumo wrestlers to symbolize Japan's economic dominance. One wrestler supports a huge cargo box that shows the value of the Japanese yen against the U.S. dollar over 20 years. In the second graph, which charts Japan's trade surplus, another Japanese wrestler swims confidently above the waterline while Uncle Sam struggles below the surface, attempting to rise above the U.S. trade deficit. Double fever lines define the strokes of both swimmers.

Although Rod's illustrations are clever and imaginative, they never overpower or obscure the facts. This helps them communicate complicated data in a clear, powerful style that's appealing to the mind and the eye. **m**

CATHY ABES, a former editor at *Macworld* and *Publish*, is the author of *Photoshop F/X* (Ventana Press, 1994) and a coauthor of *LiveMotion for Dummies* (Hungry Minds, 2000).



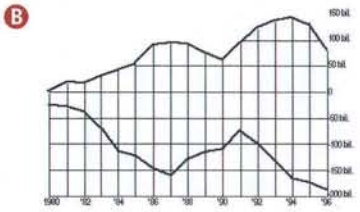
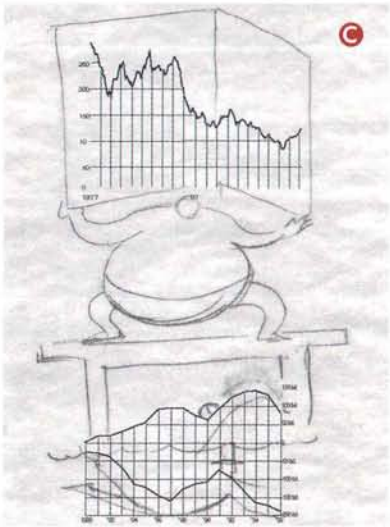
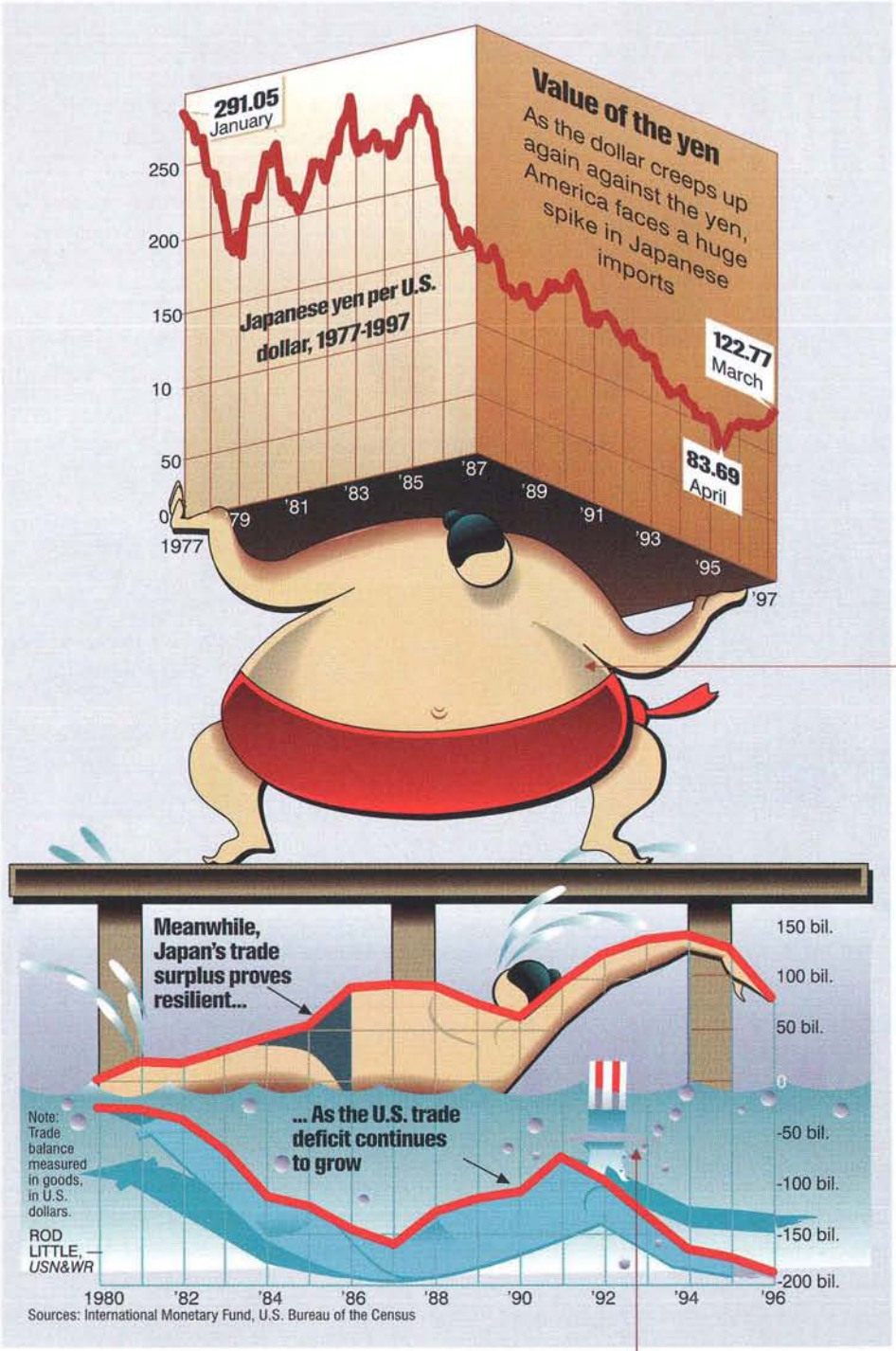


Chart the Data *Rod began by plotting the numerical data in SPSS's graphing program DeltaGraph Professional (800/543-2185, www.spss.com). Rather than using pie or bar graphs, he opted for single-line* A *and double-line* B *charts: these are best for visually comparing trends over time.*



Sketch the Design *To add illustration elements, Rod pasted the finished graphs into FreeHand, printed them out, and covered them with tissue paper. He then began sketching the figures and other elements around them* C*. Once he had a design he liked, Rod scanned the sketch and used it as a foundation for building his infographic—he outlined the shapes with the pen tool on one layer and filled each shape with colors, gradients, or blends on successive layers.*



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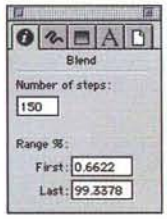
Add Blends *To emphasize the wrestler's girth, Rod added a shadow to his belly* **D**. *He began by framing the blend with two lines* **E**, *using the beige tone for the inner line and a medium brown for the outer. He then created a 150-step blend between the two* **F**. *The result was a finlike shape that blended from a dark, hard edge to a light, diffused one* **G**.

D

E

F



G

Create Transparency *To make Uncle Sam appear to be underwater* **H**, *Rod used transparency. First he added subtle tints of blue and black to several areas of the ocean's blue-green color* **I**. *He then selected both the ocean and the Uncle Sam figure. After choosing the Transparency command (Modify: Combine), Rod reduced the opacity to 83 percent; the figure's submerged portion took on a translucent variation of the ocean's color* **J**.

H **I**

J

JOSEPH SCHORR

Foolproof PDFs

Make Reliable PDFs and Avoid Common Mistakes

You exert considerable effort perfecting your documents—choosing the ideal font, nudging images into place, and much more. So when you're ready to share your work with others—whether on the Web or simply with coworkers down the hall—converting the file to Adobe's Portable Document Format (PDF) is the smart choice. Unlike HTML files, which are affected by a viewer's platform, browser, and computer setup, a PDF file can contain all the required fonts and graphics. As a result, PDFs preserve the look of your original documents with much greater fidelity. To open, read, and print your PDFs, all a person needs is Adobe's free Acrobat Reader (800/272-3623, www.adobe.com), which comes installed on most computers.

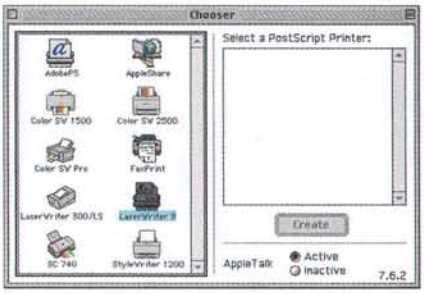
But creating a PDF that both displays and prints correctly is tricky. It's not uncommon to find headlines displayed in badly spaced Courier font, or richly textured pictures transformed into impressionistic, pixelated graphics.

To avoid these PDF goofs, you must carefully balance competing demands for compact files and high-quality graphics. For this, you need Acrobat Distiller, a component of Adobe's $249 Acrobat 5. (To follow this project using Acrobat 4's Distiller, go to www.macworld.com/2001/06/howto/distill4.html.) Though some programs let you export a document directly to PDF without using Distiller, using the approach we outline here should ensure clean, compact PDFs that are easy to distribute *and* to read. **m**

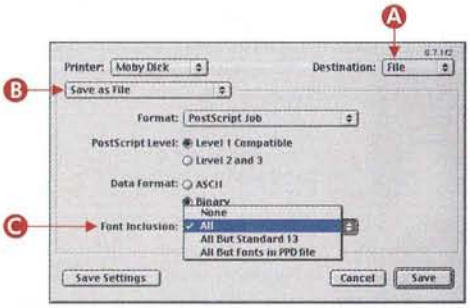
JOSEPH SCHORR is a coauthor of *Macworld Mac Secrets*, sixth edition (Hungry Minds, 2001).

1

Convert to PostScript Before you create a PDF, you must convert your original document into PostScript, the computer language used to describe high-resolution text and images for printing. Acrobat can't read Microsoft Word, QuarkXPress, or any other native document format—only PostScript.



First open the Chooser from the Apple menu and select a PostScript printer, such as LaserWriter 8, as your target device. Since Mac OS ships with the LaserWriter 8 driver, you should have it no matter which type of printer you use.



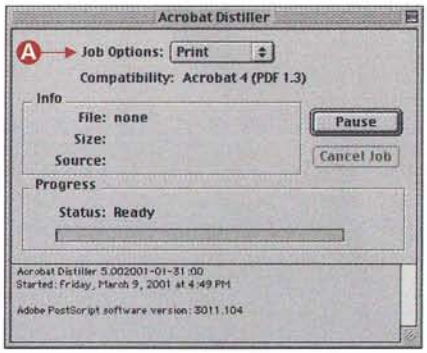
Open your document and, from the File menu, choose Print. In the Print dialog box, select File from the Destination pop-up menu **A**. *With this option selected, your document won't be sent to a printer; it can instead be translated into a PostScript file.*

Select Save As File from the main pop-up menu **B**. *Make sure that the Format menu is set to PostScript Job, and select Binary as the Data Format option. Choose All from the Font Inclusion pop-up menu* **C**; *this ensures that all the required fonts will be written directly into the PostScript file. Acrobat can't embed fonts in your PDF if you don't make them available.*

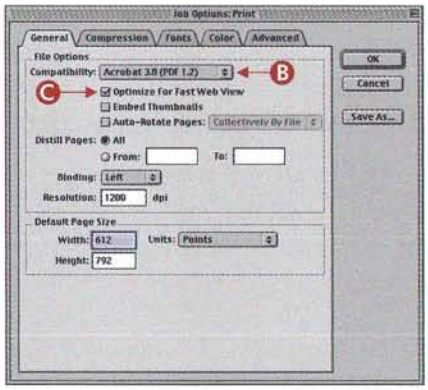
When you've adjusted all the settings, click on Save, name the file, and click on OK.

2

Tune Distiller's Job Settings When a PostScript version of your document is ready, it's time to launch Acrobat Distiller and convert the PostScript file into a PDF. Choosing the correct Job Option setting is critical to creating a good PDF.



From the Acrobat Distiller dialog box's Job Options pop-up menu A, choose the setting that best matches your PDF's intended use. If you expect people to read your document only on screen, choose Screen. This will compress your PDF to the smallest possible file size. But keep in mind that many people print PDFs—even those on the Web—so it's often a good idea to go with Print instead.



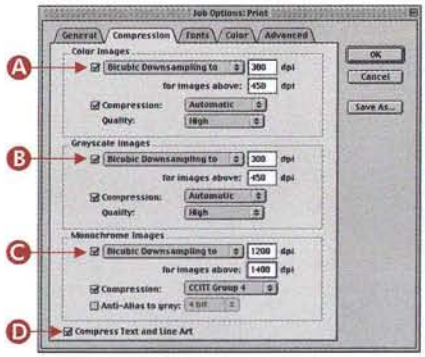
Next, choose Job Options from the Settings menu. In the resulting window, select the General tab. Choose Acrobat 3.0 from the Compatibility pop-up menu B. This ensures that everyone using version 3.0 and later can open your document.

Make sure that the Optimize For Fast Web View option is selected C. This makes your PDF smaller and helps it load faster when viewed with Acrobat's Web-browser plug-in.

3

Take Control of Compression All PDFs are compressed to some degree, but the Compression panel in the Job Options window allows you to apply *additional* compression to various types of images. Uncompressed images result in larger files; too much compression degrades image quality.

Bicubic downsampling automatically reduces the resolution of the images in your document; this can dramatically trim the total file size.



For PDFs that will appear only on screen, it's usually acceptable to downsample all color A, gray-scale B, and monochrome C images to 72 dpi. But if you expect users to magnify your documents when viewing them on screen (to zoom in on a map or a diagram, for example), that setting would make the magnified images horribly pixelated and nearly impossible to read. In such cases, downsample color and gray-scale images to 300 dpi instead—or you can turn downsampling off to leave the images at their original resolution.

Similarly, if you want users to have attractive images when they print out your documents, keep the settings at 300 dpi. Monochrome images look best at an even higher resolution, such as 600 or 1,200 dpi.

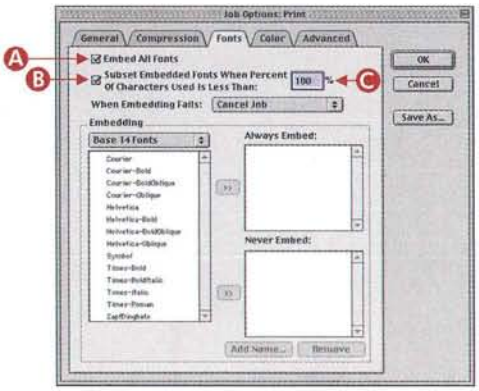
Leave the Compress Text And Line Art option D selected; it has no effect on quality.

continues

4

Embed Your Fonts One of the best attributes of PDFs is that they are self-contained: all the fonts and images are wrapped into a single file. But the fonts won't go along for the ride unless you embed them properly.

Click on the Fonts tab at the top of the Job Options window.



Select the Embed All Fonts **A** *and Subset Embedded Fonts* **B** *options, and set the percentage to 100* **C**. *This guarantees that Acrobat will display the PDF using only the fonts you've embedded in the file, even if a user's machine has fonts with the same name but slightly different metrics.*

Enabling the Subset option also keeps the size of your PDF down, because it allows Distiller to embed only the specific font characters used in the document—not the entire character set for each font.

When you have finished setting your Job options, click on OK. You are now ready to turn your PostScript file into a PDF. You may use Distiller's Open command, in the File menu, to select your PostScript file, or you can simply drag the file into the main Distiller window.

5

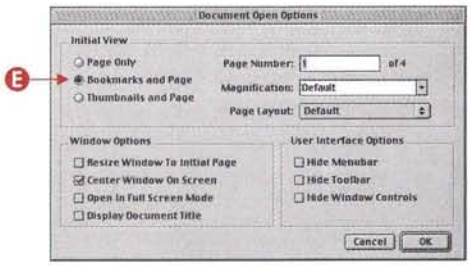
Add Navigation Tools Building an effective PDF involves more than just getting the fonts and pictures right. The best PDFs are truly *interactive* documents, with controls that help readers zero in on exactly the information they need. Including bookmarks and page-view settings with your PDF will make it even more useful to readers.

Open the new PDF in Acrobat and click on the Bookmarks tab **A** *on the left side of the screen.*

Navigate to the page you want to bookmark. Using the Magnifier tool **B**, *zoom in on the exact portion of the page you want to display. Choose New Bookmark from the Bookmark pop-up window* **C** *(⌘-B), and type a name in the bookmark's name field* **D**.

You can repeat this technique to bookmark other pages, pictures, or paragraphs. Each bookmark creates a new link in the PDF's Navigation Pane.

To be sure readers will see your bookmarks, choose Document Properties from the File menu and select Open Options. In the resulting window, select the Bookmarks And Page option **E**. *Then set the Window and User Interface options to display what you want viewers to see when they open your PDF.*



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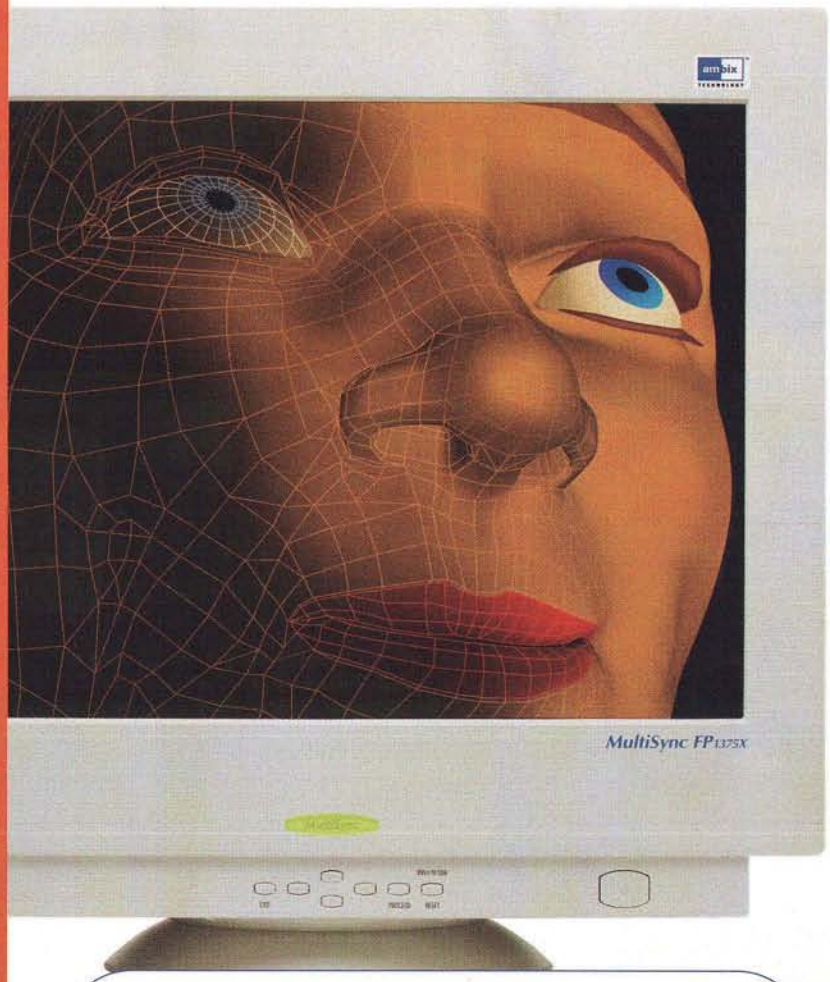

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All models feature dual system input capability. Select models feature Ambix™, the dual digital and analog technology that delivers added compatibility. With stellar performance and pricing, it's no surprise our MultiSync FPs are the monitors of choice for people who take their precision seriously.

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MultiSync® FP Series	FP955	FP1355	FP1375X
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Max Resolution	1920 x 1440 @ 73 Hz	2048 x 1536 @ 75 Hz	2048 x 1536 @ 80 Hz (analog) 1600 x 1200 @ 60 Hz (digital)
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GEOFF DUNCAN

FileMaker Can Share

Link Records to Speed Access and Prevent Duplication

A guiding principle of good database design is that each piece of information should exist in only one place—duplicating data can lead to trouble. How often have you arduously searched through a database to correct all instances of a misspelled name, for example, only to find missed cases weeks later?

You can avoid such problems by creating relationships between records. Relationships can connect two or more databases, and they're a great way to link information in the *same* database; for instance, the personnel record for a department manager at a large company could link to and display information about the employees that manager supervises.

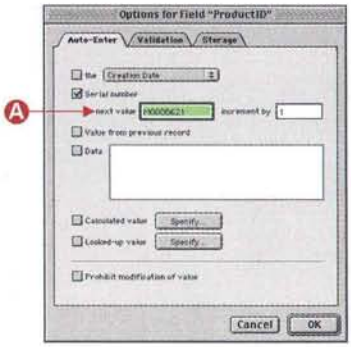
For our sample project, we used FileMaker Pro 5 to set up relationships in a database for a fictitious music retailer called One-Four-Five. The database would allow salespeople to see related products that the retailer had recommended be sold with an item—such as a small amplifier with a beginner's electric guitar—as soon as they opened that item's record. Music may not be your thing, but these techniques can apply to many business and personal databases—and they're handy for Web publishing and work in FileMaker Pro 3.X, 4.X, and 5.X. **m**

GEOFF DUNCAN is the technical editor and chief database wrangler for TidBits (www.tidbits.com), a free weekly online Macintosh newsletter.

1

Create New Fields Before you can create relationships among records, you must define a couple of new fields. You'll need an ID field (so each record will have a unique identifier, such as a serial number). You'll also need a field where you can enter a list of IDs for related records.

Create a text field with a descriptive name, such as our example's ProductID, in FileMaker Pro's Define Fields dialog box. Choosing a text field rather than a number field lets you use letters in your ID "number."



Click on the Options button, select the Serial Number option, and add a serial number to the Next Value field A. If this database already contained 620 products, we could start with M0000621—FileMaker Pro would increase the value of each new record's ID number, even with the letter M. You can fill in ID values for existing records using FileMaker Pro's Replace feature (press ⌘-= [equals sign] to access it).

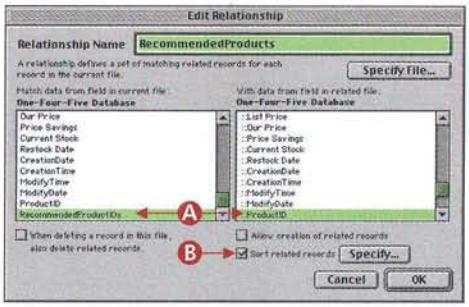
Next, make a second text field to contain the ID numbers of the records you want to access from the current record. In our example, we wanted to see recommended products, so we created a field called RecommendedProductIDs.

TIP: *Don't use a repeating field, since you'd have to know the maximum number of records you'd ever relate to another; an ordinary text field can link to thousands of records if necessary.*

2

Make Your First Relationship Now you can define a relationship between the two fields you created in step 1. FileMaker Pro uses this relationship to locate the related data.

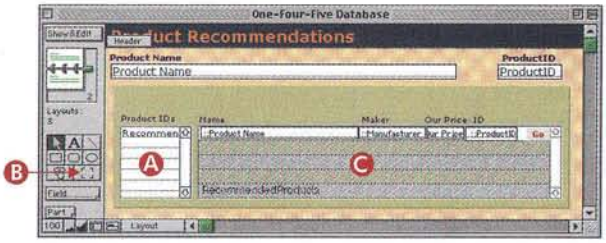
Open FileMaker Pro's Define Relationships dialog box (from the File menu), and click on the New button. It feels a little counter-intuitive, but use the resulting dialog box to select the database file in which you're currently working.



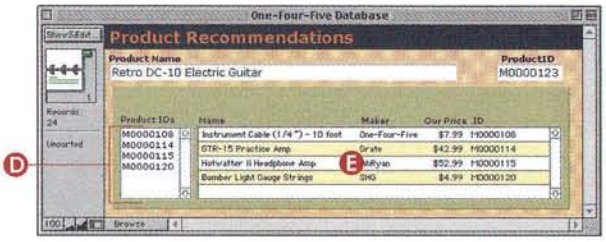
Once you select the file, FileMaker Pro will open the Edit Relationship dialog box for you. Give the relationship a descriptive name, such as our example's Recommended-Products. Then set up a relationship between the fields you created in step 1 Ⓐ. If you want to specify how FileMaker Pro will sort the related records' data, select the Sort Related Records option Ⓑ. You can sort by any fields in your database. If you're not sure which criteria to choose, don't worry—you can change the sort order later by editing the relationship.

3

Create a Portal with Related Fields When you use your database, you'll want to see more than just the ID numbers of your related records. What you need is a *portal*—a layout object that displays rows of information from related records.



In FileMaker Pro's Layout mode, we created a layout containing our ProductID and RecommendedProductIDs fields, making the latter a scrolling field Ⓐ. We then used the Portal tool Ⓑ to create a portal Ⓒ. In the Portal Setup dialog box, we chose the relationship we'd created in step 2 and formatted the portal to contain several rows and a vertical scroll bar. Data from related records should appear in this portal, so we added related fields—such as Product Name and Price—to its top row.



After creating your portal, switch to Browse mode to test your work. All that's left for us to do now is enter ProductID values into the RecommendedProductIDs field Ⓓ; in our example, these values represent products recommended with an electric guitar. (Each ID value must be by itself on a line ending in a return, or FileMaker Pro won't find the related records.) When we exit the ProductID field, the portal displays related information Ⓔ. By following this procedure, you'll be able to see related data without having to duplicate it. (And if you edit information in the portal, you're actually editing the related record.)

continues

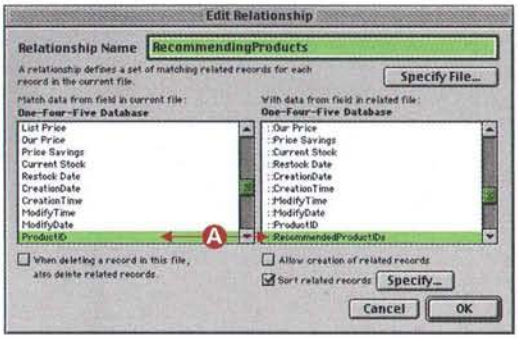
More Info:
www.macworld.com/2001/06/howto/sample.html

Download our sample One-Four-Five database to see how relating your database to itself can make your life easier.

LINK

4

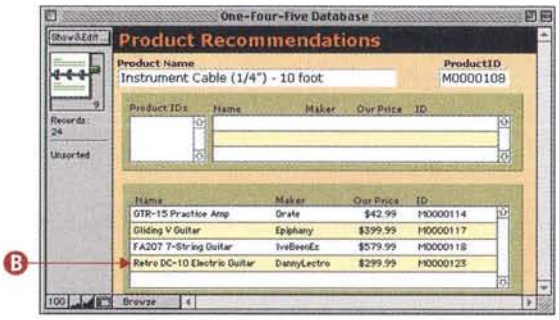
Make Another Relationship and Portal
We could stop here, but the relationships are lopsided: the guitar's record displays products recommended with it, but those products' records don't show that they're recommended with the guitar. To make a two-way relationship, you need to create a second relationship and portal.



Open FileMaker Pro's Define Relationships dialog box, and click on the New button. Create a new relationship to your current database file (just as you did in step 2), and give your second relationship a descriptive name, such as our example's RecommendingProducts. Then do the reverse of what you did in step 2. In our example, that meant matching the ProductID field in the current file to RecommendedProductIDs in the related file **A**.

In Layout mode, use the Portal tool to open a second portal on your layout. We added related fields to the top row of this portal: these fields will display information from records recommending the current product.

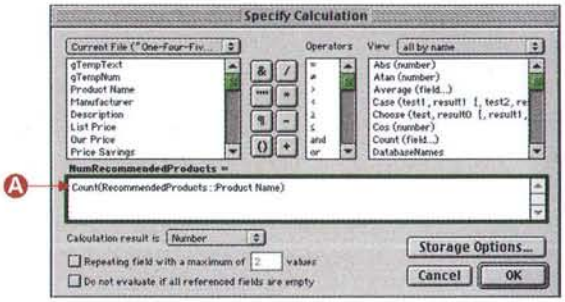
You can see the results by switching to Browse mode. Going to a record for one of our recommended products—an instrument cable—we see that a guitar isn't recommended with the cable (that wouldn't make sense), but the second portal shows that the cable is recommended with the electric guitar **B**.



5

Once You've Got It, Flaunt It Now that your relationships are in place, take advantage of the information they provide. You can integrate similar portals into other layouts and create new fields that tally the records in your portals.

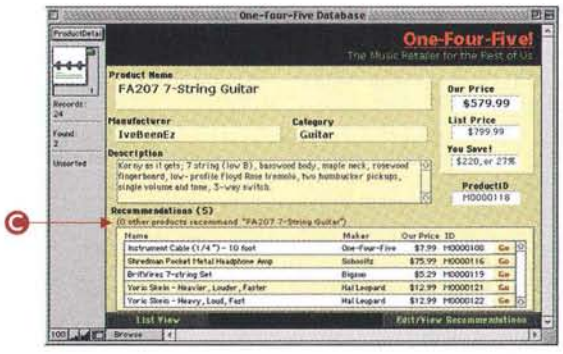
Our example is a product layout that a salesperson might use. The layout contains only one portal for recommended products—you don't need both portals to be visible on a layout to use the information they provide. We created two new calculation fields, NumRecommendingProducts and NumRecommendedProducts, which use FileMaker Pro's Count function **A** *to determine how many records we link in each relationship.*

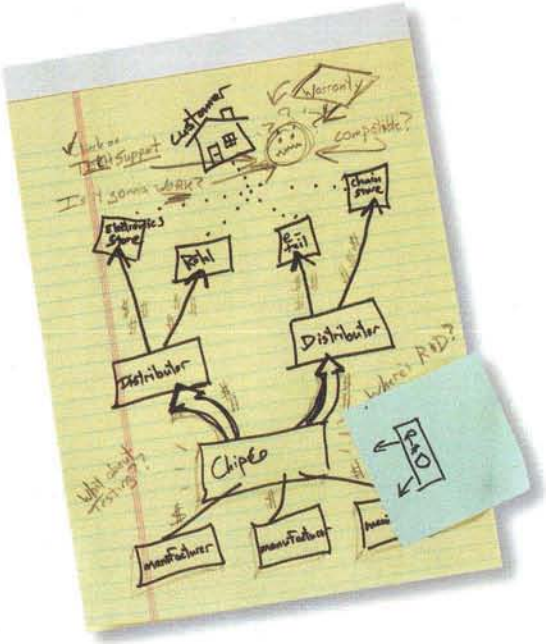


To add the calculation fields to a layout, switch to Layout mode and place the cursor in a text object (such as a field label), press ⌘-M to enter the field name as a merge field, and select your calculation field **B**.

B

When you switch to Browse mode, FileMaker Pro will automatically place the field's value in your text object **C**.





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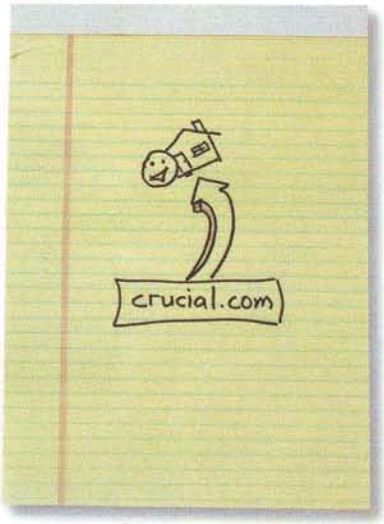

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CHRISTOPHER BREEN

Mac 911

Proving that one can't know *everything* about the Macintosh, I begin this month's column by asking a group of benevolent strangers for assistance with a little AirPort-related problem of my own. And to demonstrate that I'm not wholly bereft of solutions, I offer answers to questions regarding pasting graphics into Microsoft Word tables, segmenting large files, and conserving an ink-jet printer's ink.

AirPort Access

Recently I posted a question on the Mac 911 Troubleshooting forum. I asked its visitors to provide information on using an AirPort-less Mac to access the Internet over an AirPort network—but my problem wasn't so much *getting on* to the Web (Macs on an Ethernet network can access the Web via an AirPort Base Station). Rather, I wanted to know how to easily terminate my connection from that AirPort-less Mac.

For those of you who've read the previous paragraph six times and still have no idea what I'm talking about, here's a little insight. To connect an Ethernet-networked Mac through an AirPort Base Station to the Web, you wire your network this way: Using standard Cat 5 Ethernet cable, connect an AirPort Base Station and the non–AirPort-equipped Mac to an Ethernet hub. Run a phone line from the Base Station's modem port to a phone jack. In the Network window of the AirPort Admin Utility application, configure AirPort to share a single IP address using DHCP (Dynamic Host Configuration Protocol), and select both of these bridging options: Enable DHCP Server On Ethernet, and Enable AirPort To Ethernet Bridging (see "AirPort Connection"). With this setup, any time you check your e-mail or fire up a browser on your Mac, you'll initiate a dial-up connection through the Base Station.

That's all well and good, but there's a catch: you can't easily break the dial-up connection from the Mac. That's because you can't run the AirPort software, which supplies a disconnect button, if your Mac doesn't have an AirPort card. (I know someone's going to suggest it, but no, I don't care to wait for a period of inactivity to terminate the connection.)

Happily, the solution is easier to explain than the problem. Damien Barrett, a visitor to the Troubleshooting forum, recommended Larry Rosenstein's free AirPort Modem Utility, which allows you to initiate or terminate a dial-up connection simply by clicking on the utility's Connect or Disconnect button. And its small window displays the Base Station's IP address and connection status.

Picture Pasting

An e-mail message from reader Chong Chee Nian incidentally points up yet another way in which Microsoft Word 2001 is superior to Word 98. Mr. Chong attempted to paste pictures into table cells in a Word 98 document and discovered that the graphics appeared outside the table, rather than within the cell.

The simple, though costly, answer to this problem is to upgrade to Word 2001, which pastes graphics into a cell as you'd expect. Performing this trick in Word 98 takes a bit more effort:

continues

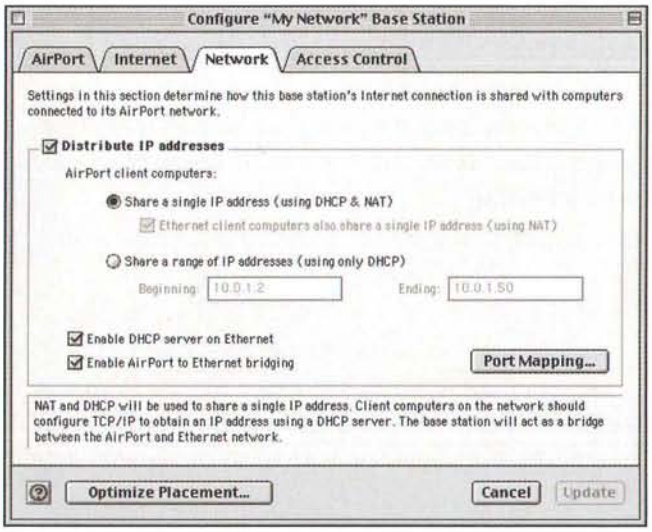
With a picture ready to paste, click inside a cell and choose Paste Special from Word 98's Edit menu. In the dialog box that appears, select Picture and deselect the Float Over Text option. Click on OK, and the picture appears within the cell.

Segmenting Sources

A user known to me only as MacManiac asks how to segment a very large file across several Zip disks on-the-cheap. Although Aladdin Systems' StuffIt Deluxe ($80; 800/732-8881, www.aladdinsys.com)—and its accompanying drag-and-drop application, DropSegment—is my segmenting software of choice, as a die-hard penny-pincher, I respect this maniac's desire to use something less expensive.

That something is also available from Aladdin Systems—StuffIt Lite. This $30 application allows you to chunk your files into any size you like by choosing Segmenting from the Translate menu. You can try it yourself after downloading the demo version from Aladdin's Web site.

But if you're a *real* cheapskate, you'll opt for Apple's free Disk Copy Scripts (http://asu.info.apple.com/). This collection of add-on AppleScripts contains the Segment Image script that lets you divide image files into bite-size bits. To use it, simply place the Segment Image script into the Scripts folder inside the folder on your Mac containing Disk Copy (by default, Disk Copy is in the Utilities folder). Now drag the file you want to segment into a new folder. Launch Disk Copy, and then create an image file for the new folder that contains your original file by selecting Create Image From Folder in the Image menu.



AirPort Connection You can share an AirPort connection over an Ethernet network by selecting the Enable AirPort To Ethernet Bridging option in the AirPort Admin Utility application.

Tip of the Month

If you want to batch edit ID3 tags in Casady & Greene's **SoundJam**, just drag a folder full of MP3s to a playlist, highlight the playlist, and press ⌘-I. A dialog box—in which you can edit attributes such as artist, album, and year for the entire collection of MP3s—then appears. You can perform the same trick in Apple's **iTunes** by selecting a group of MP3s (sorry, the folder trick won't work) in a playlist and pressing ⌘-I.

Richard Hayes
Flagstaff, Arizona

Next, choose Segment Image from the Scripts menu and indicate whether you'd like to segment by size or number of parts. In the resulting Open dialog box, select the image file you just created, click on OK, and choose a location for the segmented files in the Save dialog box that appears. Now stand back while Disk Copy verifies and segments your file.

Conserving Colors

Finally, my loving wife happened to mention that it is awfully wasteful to replace an entire color ink-jet cartridge simply because one has consumed a single hue. She tolerated my explanation that this is a plot by the printer manufacturers to sell costly supplies (after all, the profit lies in the consumables, not the printers). But she felt it necessary to nudge me with "And how exactly does that address my problem, Mr. Mac 911?"

After some hemming, hawing, and throat clearing I suggested that she contact InkSite (877/465-7483, www.inksite.com) to inquire about its refillable ink cartridges. Designed to work with today's most popular ink-jet printers, these cartridges cost a fraction of the price of those sold by printer manufacturers. They can be refilled with ink available from InkSite, and despite implied threats to the contrary, using them shouldn't void your printer's warranty. **m**

Contributing Editor CHRISTOPHER BREEN is a coauthor of the brand-spanking-new *My iMac*, second edition (2001, IDG Books Worldwide).

Share tips and discuss Mac problems with other Mac users in the Mac 911 Forum (www.macworld.com/subject/mac911). Also send tips by e-mail to mac911@macworld.com. We pay $50 for tips selected for publication in *Macworld*. All published submissions become the sole property of *Macworld*.

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Kevin Browne, General Manager, Macintosh Business Unit, Microsoft Corporation
Thursday, July 19, 2001
9:00 am – 10:00 am

TBA
Friday, July 20, 2001
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Thursday, July 19, 2001
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2:00 pm – 3:00 pm

Friday, July 20, 2001
11:00 am – 12:00 pm

Exposition Hall
Wednesday, July 18 – Thursday, July 19, 2001
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Power Mac G4s

Apple Ships the Two Fastest Macs Ever. But Which Is Faster?

POWER MAC G4/533 DUAL PROCESSOR

Rating: ♦♦♦♦½

Pros: Great performance for a good price; includes CD-RW drive.

Cons: No audio-input port.

Company's estimated price: $2,499

Company: Apple Computer, *800/692-7753*, **www.apple.com**

POWER MAC G4/733

Rating: ♦♦♦♦

Pros: SuperDrive allows DVD authoring; the fastest Mac around for most tasks.

Cons: Expensive; SuperDrive reads slowly; no audio-input port.

Company's estimated price: $3,499

Company: Apple Computer, *800/692-7753*, **www.apple.com**

MACWORLD'S BUYING ADVICE:

Each of these speedy Power Mac G4s is perfect for a particular type of user. If you need a reasonably priced Mac that shines with multiprocessor-aware applications such as Adobe Photoshop and Cinema 4D XL, or if you want to run OS X, the 533MHz dual-processor G4 is the Mac for you. If money is no object and you want top speed for all but multiprocessor-aware programs, plus the ability to create DVDs that work with commercial players, your choice should be the 733MHz G4—the only Mac with the SuperDrive.

Macworld LAB TEST

DAVID PAPAS

Until recently, those who desired the fastest Mac that money could buy simply sought out the one with the highest megahertz rating. But with the release of the 733MHz and dual-processor 533MHz Power Mac G4 models, speed-hungry consumers must delve a little deeper. Although the G4/733 boasts the higher megahertz rating, the dual-processor G4/533 significantly outperformed Apple's top-of-the-line Power Mac in several of our tests. And if you plan on upgrading to OS X, the dual-processor Mac is an even better choice.

It's What's Inside That Counts

Except for the type and quantity of processors, the $2,499 dual-processor 533MHz Power Mac is configured exactly like the single-processor 533MHz G4 model: with 128MB of SDRAM, a 40GB Ultra ATA hard drive, a 1MB L2 cache, a 133MHz system bus, three RAM slots, a 4× AGP slot, four 64-bit PCI slots, an internal 8×4×32× CD-RW drive, a 32MB Nvidia GeForce2 MX graphics card, gigabit Ethernet, and a 56K internal modem. Both G4s lack an audio-input port and require 133MHz RAM, so your old RAM won't work in these systems.

The $3,499 733MHz Power Mac, by contrast, carries a single G4 processor with twice the SDRAM (256MB); half again the storage (a 60GB Ultra ATA drive); a 256K L2 *and* a 1MB L3 cache; a SuperDrive, which reads and writes both CDs and DVDs (at 8×4×24×, with a 2× DVD-R write speed); and a copy of iDVD, for burning DVDs. (For $500 less, Apple will substitute a CD-RW

drive for the SuperDrive; we tested the SuperDrive model.)

What a Difference a Chip Makes

When multiprocessor (MP) support returned to the Mac last year, many people wondered if two slower processors working in tandem were really faster than a single processor with a higher megahertz rating. Our tests show that they can be, when running applications optimized for multiple processors.

For example, in our Adobe Photoshop tests, MP-aware operations such as Gaussian Blur and Unsharp Mask were swifter on the dual-processor 533MHz model than on the 733MHz Mac by a second or two. And in our Cinema 4D XL rendering test, the dual-processor Mac outpaced the 733MHz Mac by more than 35 percent. In situations where MP optimization doesn't matter—such as our Speedmark, Photoshop RGB to CMYK, and SoundJam tests—the 733MHz Mac pulled ahead of the multiprocessor machine. That faster processor didn't help much in Quake III, however, adding less than 5 percent to the overall frame rate.

Although these results may seem disheartening given the SuperDrive-bearing 733MHz Power Mac's $1,000 premium, there's a strong likelihood that these scores will change as new versions of certain applications and of Mac OS are released. That's because the 733MHz Power Mac has a more recent iteration of the PowerPC G4 processor (the 7450) than the single- and dual-processor 533MHz Macs, which have the older 7410 processor. Among other differences, the 7450 chip carries an L3 cache. But it's new enough that software developers have yet to take advantage of the chip's capabilities. Once applications and Mac OS are optimized for the 7450 chip, performance should improve.

A Super Drive

Although performance is important to every Mac user, the speed of the 733MHz Power Mac may be a secondary consideration for those interested in creating DVDs to play back on home DVD players. At present, only the $3,499 Power Mac configuration includes a SuperDrive, the CD and DVD player and recorder that makes this possible.

Our experience with the SuperDrive and the accompanying iDVD was mostly positive. Although iDVD locked up during one project, in a subsequent attempt we created a DVD full of QuickTime movies in a matter of minutes. (Burning the DVD took about three times longer than the DVD's playing time.)

iDVD is easy to use, and the bundled themes let you create attractive DVDs with intuitive interfaces. While we're thrilled with this ability, iDVD has its limitations. For example, you can place only six elements on a screen, although nesting folders may help compensate. And each DVD holds only an hour of video.

Less impressive than the SuperDrive's DVD-writing capabilities is its speed. The drive is a sluggish reader, taking 5 minutes and 33 seconds to install Quake on the 733MHz Mac. For comparison, we used the DVD-RAM drive from a 500MHz G4 to install Quake III again. On this go-around, Quake installed in just 3 minutes and 49 seconds.—CHRISTOPHER BREEN

LINKS

More Info:
www.macworld.com/2001/04/reviews/powermacg4.html

Macworld reviews the single-processor Power Mac G4/533.

More Info:
www.macworld.com/2001/03/14/idvd.html

Learn your way around iDVD by reading this online diary at Macworld.com.

A Day at the Races

Macworld LAB TEST

Reference systems in italics.
Best results in bold.
Longer is better. Shorter is better.

	SPEEDMARK 2.1	QUAKE III (V1.27H)	SOUNDJAM 2.5.2	CINEMA 4D XL 6.3	ADOBE PHOTOSHOP 6.0.1			
	Overall Score	Normal	MP3 Encode		Gaussian Blur	Unsharp Mask	RGB to CMYK	Lighting Effects
Apple Power Mac G4/733	**183**	**82**	**1:22**	10:26	5	6	**15**	6
Apple Power Mac G4/533 DP	176	79	1:47	**6:45**	**3**	**5**	25	**4**
Apple Power Mac G4/533	*168*	*74*	*1:59*	*13:21*	*5*	*7*	*26*	*7*
	Better ▶	Better ▶	◀ Better	◀ Better	◀ Better	◀ Better	◀ Better	◀ Better

Speedmark scores are relative to those of an iMac 350MHz (1999), which is assigned a score of 100. Quake scores are in frames per second. SoundJam and Cinema 4D XL scores are in minutes:seconds. Photoshop scores are in seconds. We tested each system with Mac OS 9.1 installed; a default system-disk cache; virtual memory enabled (except for Speedmark and Quake tests); 256MB of RAM (for Speedmark, we used the standard configurations of 256MB on the 733MHz G4 and 128MB on the 533MHz models); and displays set to 24-bit color and 1,024-by-768-pixel resolution. We ran Quake III's Time Demo 1, converted from version 1.17, at a resolution of 640 by 480 pixels, with graphics set to Normal. We tested SoundJam's MP3 encoding with an audio-CD track that was 9 minutes and 25 seconds long and converted it using a default setting of 128 Kbps. We set Cinema 4D XL's memory partition to 80MB and rendered a 640-by-480-pixel model with oversampling set to 4 by 4. For Photoshop tasks, we used a 50MB file, with the memory partition set to 150MB and History set to Minimum. For more information on Speedmark, visit www.macworld.com/speedmark.—**Macworld Lab testing by Ulyssis Bravo and Jason Cox**

iMac and iMac Special Edition

500MHz, 600MHz Models Chime in with CD-RW Drives and a Funky New Look

iMAC 500

Rating: ♦♦♦♦

Pros: Includes CD-RW drive; great audio features; good mix of software; respectable hard drive.

Cons: Only 64MB of RAM.

Company's estimated price: $1,199

Company: Apple Computer, *800/692-7753*, **www.apple.com**

iMAC 600 SPECIAL EDITION

Rating: ♦♦♦♦

Pros: Includes CD-RW drive; great audio features; good mix of software; faster processor; large hard drive.

Cons: Only 128MB of RAM.

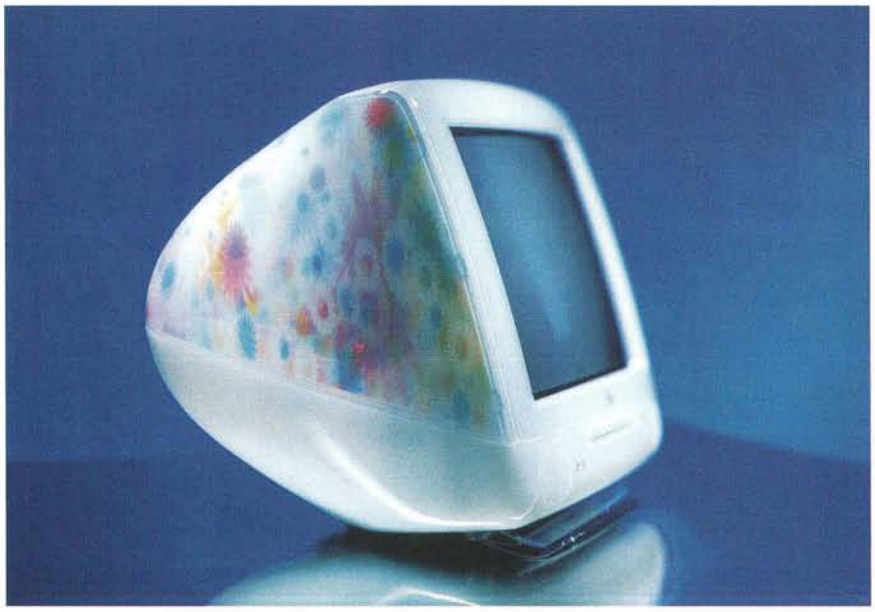
Company's estimated price: $1,499

Company: Apple Computer, *800/692-7753*, **www.apple.com**

MACWORLD'S BUYING ADVICE:

The new iMacs are spectacular consumer machines—it would be hard to imagine a better computer for a student. But we recommend the 600MHz iMac Special Edition over the 500MHz iMac; it comes with the RAM allotment recommended for running Mac OS X, has a moderately faster processor, and boasts twice the hard drive space, all for only $300 more.

Macworld LAB TEST



SCOTT PETERSON

Since its debut in 1998, the iMac has become something of a celebrity, influencing the industrial design of everything from cell phones to PCs. Yet for all the design hype, Apple's goal with the original iMac was simple: to offer an Internet-ready, all-in-one machine that anyone could set up and use.

The latest additions to the line, the 500MHz iMac and 600MHz iMac Special Edition, carry on that tradition in grand form but with a new focus: music. Previous iMac releases targeted digital video and Internet readiness, shipping with DVD-ROM drives and iMovie, for example. The new models' inclusion of CD-RW drives and iTunes signals that these machines are all about the audio experience—down to the color schemes that Apple says were inspired by music. Their only real drawback is the paltry amount of included RAM.

Made for Music

If you've been itching to get in on the digital-music revolution, all you need is an iMac and some 75-cent CD-Rs (to get you started, two are included). Both new iMacs come loaded with iTunes 1.0, Apple's software for playing and encoding MP3s and burning audio CDs.

The CD-RW drive is slower than top-end drives, writing CD-Rs at 8× and CD-RWs at 4× (newer external drives can write CD-Rs at up to 16× and CD-RWs at 10×). Still, it can write a disc in less time than it takes to play it—about 10 minutes to burn 650MB. And because the CD-RW drives read at slower speeds than the DVD-ROM drives on these iMacs' predecessors,

the new machines took longer to install Quake. However, most users will find these write speeds perfectly acceptable.

Speed aside, these new iMacs live up to Apple's "Rip. Mix. Burn." advertisements quite well. Ripping individual tracks in iTunes couldn't be easier. When you first insert a blank audio CD into an iMac with an Internet connection, iTunes automatically queries Gracenote CDDB—an online database of CD artists, albums, and tracks—and imports that information for you. When you turn CD tracks into MP3s, iTunes labels your new files and lists them in your music library.

Burning is equally easy. You drop your newly ripped tracks into a playlist, insert a blank CD, and click on the Burn CD icon. iTunes burns only audio CDs, however; to burn a data CD, you'll have to use Apple's free Disc Burner software. (For multisession, cross-platform, or video CDs, you need Adaptec Toast; Disc Burner burns only single-session CDs.)

Unlike the new line of Power Mac G4s, which rely on USB or FireWire for bringing in audio, these machines come with analog audio input and output minijacks and feature up to 16-bit stereo and a 44.1kHz sampling rate—the standard for CD-quality sound. This is great if you want to use an audio source other than CDs or the Internet, such as a microphone or an LP deck.

iMovie Ready

For all their audio capabilities, these iMacs have sacrificed none of the DV-editing strengths of the previous models. They come with iMovie 2, two FireWire ports, and a 20GB drive (on the 500MHz model) or 40GB drive (on the 600MHz model)—plenty of space to store your DV files. And both machines include an ATI Rage 128 Ultra graphics card with 16MB of SDRAM, for lightning-fast rendering during game play and video work. Although it can't match the GeForce3 (to be included in future Power Mac G4s), this is a great graphics card for consumer machines.

Sound Bargains

Macworld LAB TEST

Reference systems in italics. **Best results in bold.**
Longer is better. Shorter is better.

	SPEEDMARK 2.1 Overall Score	QUAKE III Normal	SOUNDJAM 2.5.2 MP3 Encode
Apple iMac 500 with 64MB RAM*	118	31	2:54
Apple iMac 600 Special Edition with 128MB RAM*	133	36	2:25
*Apple iMac 500 DV Special Edition with 128MB RAM***	*131*	*32*	*2:45*
Apple Power Mac G4/466 with 128MB RAM	***157***	***46***	***2:00***
	Better ▶	Better ▶	◀ Better

Speedmark scores are relative to those of an iMac 350MHz (1999), which is assigned a score of 100. Quake scores are in frames per second. SoundJam scores are in minutes:seconds. We tested each system with Mac OS 9.1 installed, the standard RAM configuration, a default system disk cache, and virtual memory enabled for all tests except SoundJam. We set displays to 1,024 by 768 pixels and 24-bit color. We tested MP3 encoding with an audio-CD track that was 9 minutes and 25 seconds long and converted it in SoundJam using a default setting of 128Kbps. We tested Quake III v.1.17 at a resolution of 640 by 480 pixels, with graphics set to Normal. For more information on Speedmark, visit www.macworld.com/speedmark.—**Macworld Lab testing by Jason Cox and James Galbraith**

* *Flower Power* ** *Snow*

Appearances Aren't Everything

Apple, not content to encase these new models in mere solid colors, says the Flower Power and Blue Dalmatian motifs reflect the way music would look. That may be, but we're glad they also come in the familiar indigo (iMac) and graphite (iMac Special Edition).

Along with an optical Apple Pro Mouse and full-size Apple Pro Keyboard, these models come with a useful mix of software: Adobe Acrobat Reader; Apple's AppleWorks 6, Disc Burner, and iMovie 2; Palm Desktop; Microsoft Internet Explorer and Outlook Express; Netscape Communicator; and Quicken 2001.

Under the hood, the G3 iMacs fall short of their G4 siblings (see "Sound Bargains"). In every benchmark category, the 466MHz G4 Power Mac walloped the 500MHz and 600MHz G3 iMacs. In particular, the SoundJam and Quake test results show off the power of AltiVec-enabled applications when they're run on a G4 processor.

One limitation of the latest iMacs is their skimpy allotment of RAM. They ship with OS 9.1, but if you want to install OS X on the 500MHz model, you'll have to *double* its 64MB of RAM. The 600MHz Special Edition comes with 128MB of RAM, but even that seems more appropriate to a base model than to a high-end iMac.

And like previous iMacs, these models have only two RAM slots. This means that if you buy an additional 64MB of memory, both slots will be full.

New to these iMacs is the size of the backside cache: 256K, half the 512K of earlier editions and the current 400MHz model. Apple claims that since the cache runs at the same speed as the processor, rather than at a 5:2 ratio, the chips are roughly equivalent, and our experience bears this out. The new 500MHz model suffers more from the lower amount of RAM than from the smaller L2 cache.—MATHEW HONAN

More Info:
www.macworld.com/2001/04/17/reviews/flowerpower1.html

Read more about Mathew Honan's experiences with the 500MHz iMac.

LINK

Conference-Room Projectors

Bright Projectors Are Losing Weight, Coming Down in Price

MACWORLD'S BUYING ADVICE:

While the Epson Powerlite 5600P doesn't support the highest of resolutions, and though it was the heaviest projector in our roundup, it packs the most lumens, and it provided the highest-quality images in our tests. You may also want to consider the InFocus Proxima DP6150. It's priced $400 less than the Powerlite, and its light weight and consistently good image quality make it a fine value. Defying our expectations, it even outperformed its brighter, more expensive sibling, the Proxima DP6850+.

The Epson Powerlite 5600P

PETER BELANGER

Now might be the time to replace your aging projector—or perhaps your butcher-paper presentations are beginning to lose appeal. If you're considering a conference-room projector, the current contenders are brighter than their predecessors, and prices are comparatively lower. Macworld Lab looked at eight that cost less than $7,000 and pack enough punch to brighten even the largest conference room: Boxlight's CP-731i, Epson's Powerlite 5600P, Hitachi's CPX325W and CPX960W, InFocus's Promixa DP6150 and DP6850+, NEC's Multisync LT155, and Philips Electronics' cBright XG1. The Powerlite 5600P offered the best image quality in our tests.

Bright Ideas

When you choose a projector, image quality should be a primary concern; often, the brighter the projector, the better the image. A bright projector can throw a crisp, clear image, even if there's a lot of ambient light in the room, and it can project across a great distance. The brightness of a projector can be measured in ANSI lumens (the American National Standards Institute, a private, nonprofit organization, develops standards for the electronics industry)—the higher the number, the brighter the projector.

For a large conference room (say, larger than 15 by 15 feet), you'll want a projector rated at 1,200 lumens or brighter, and all of our projectors fit this requirement.

Meet the Projectors

These eight projectors all employ triple-LCD technology, which uses LCDs, lenses, and mirrors to combine red, green, and blue light sources.

Macworld LAB TEST

(Another projection technology is DLP [digital light processing], in which a single beam of light passes through a rotating color wheel and is reflected by a digitally controlled panel of microscopic mirrors.)

Only the Powerlite 5600P and the Proxima DP6150 have digital inputs (in addition to analog), but we didn't perceive any benefits in using them. And the Powerlite 5600P sometimes failed to recognize which input setting had been selected.

The projectors feature easy-to-use on-screen menus for adjusting image settings, image position, and geometry. They also include remotes and, except for the Powerlite 5600P and the cBright XG1, laser pointers. The remotes that come with the CPX325W, the CP-731i, the MultiSync LT155, and the Powerlite 5600P all use swiveling selection buttons, which you can use to control mouse movements and navigate the projector's built-in menus. But I preferred the remotes for the cBright and both Proximas—each had a trackball, which felt more intuitive. And all of the projectors have USB ports for easily adding a mouse. The largest projector we tested was the Powerlite 5600P, which measured 11 by 16 by 6 inches, and the smallest was the 8-by-11-by-3-inch MultiSync LT155.

Projector Pageant

Macworld LAB TEST

••• Excellent •• Fair • Poor	Brightness	Contrast	Color	Gray Scale	Text
Boxlight CP-731i	••	••	••	••	•••
Epson Powerlite 5600P	•••	•••	•••	•••	••
Hitachi CPX325W	••	••	••	••	••
Hitachi CPX96OW	••	••	•	••	••
InFocus Proxima DP6150	••	••	•••	••	••
InFocus Proxima DP6850+	••	••	••	•	••
NEC MultiSync LT155	••	••	•••	••	•••
Philips Electronics cBright XG1	••	•	•	••	••

We conducted subjective tests, determining quality to be excellent, acceptable, or poor in each category. We tested each projector at its factory defaults and then made adjustments as needed. We tested each projector at its native resolution. Our test images were a color and a monochrome Adobe Photoshop 6.0 file and a Microsoft (Office 98) PowerPoint file. Results were determined by a three-person jury. All tests were performed on a Power Mac G4 running OS 9.0.4, with 128MB of RAM, and with an ATI Rage Pro 128 graphics card with 16MB of VRAM.—**Macworld Lab testing by Brett Larson**

The Image Factor

Out of the box, most of these projectors performed well, but the Powerlite 5600P pulled ahead of the pack, producing bright images with stunning detail. The cBright XG1, in contrast, projected images that were noticeably too red and that lacked some detail clearly visible in the other projectors' output. Using the color and image settings, we attempted to adjust for these problems, but we were unable to produce significantly better results. We found that we could improve the image quality of the MultiSync by making similar adjustments, but we weren't able to improve its output quality enough to raise its test scores from Acceptable to Excellent.

In our gray-scale test, all but the Promixa DP6850+ performed well, but the Powerlite 5600P was the only one that did very well. The DP6850+'s gray-scale image lacked detail.

In our text tests, the Boxlight CP-731i and the MultiSync LT155 both did very well, clearly projecting the 8-point characters in our test file. The Powerlite 5600P, producing clear text only as small as 12 points, slipped behind here. For the other projectors, text was fuzzy below the 28-point mark, and difficult to decipher below the 10-point mark.

Despite its lower resolution, text was the only area in which the Powerlite did not excel—even then, it was superior to a few higher-resolution projectors. We highly recommend the Powerlite for most tasks.—BRETT LARSON

Projectors Compared

COMPANY	PRODUCT	MOUSE RATING	COMPANY'S ESTIMATED STREET PRICE	CONTACT	BRIGHTNESS (IN LUMENS)	NATIVE RESOLUTION (IN PIXELS)	WEIGHT (IN POUNDS)
Boxlight	CP-731i	♦♦♦½	$4,599	800/497-4007, www.boxlight.com	1,400	1,024 × 768	7.2
Epson	Powerlite 5600P	♦♦♦♦½	$5,399	800/463-7766, www.epson.com	2,200	800 × 600	14.9
Hitachi	CPX325W	♦♦♦½	$4,449	800/441-4832, www.hitachi.com	1,400	1,024 × 768	7.0
	CPX96OW	♦♦♦	$5,200	800/441-4832, www.hitachi.com	1,800	1,024 × 768	13.0
InFocus	Proxima DP6150	♦♦♦♦	$5,299	800/294-6400, www.infocus.com	1,400	1,024 × 768	7.9
	Proxima DP6850+	♦♦♦	$6,299	800/294-6400, www.infocus.com	1,800	1,024 × 768	13.0
NEC	MultiSync LT155	♦♦♦♦	$5,995	800/632-4636, www.nectech.com	1,200	1,024 × 768	4.9
Philips Electronics	cBright XG1	♦♦½	$4,999	800/326-6586, www.philips.com	1,100	1,024 × 768	7.9

iTunes 1.1

Free and Easy Application from Apple Plays, Encodes Music

iTUNES 1.1

Rating: ♦♦♦♦

Pros: Nearly as capable as Casady & Greene's SoundJam MP Plus; lets you burn CDs from within the program; free.

Cons: No additional skins or visual plug-ins; can disable some CD-burning extensions.

Company's estimated price: Free

Company: Apple Computer, *800/692-7753*, **www.apple.com**

MACWORLD'S BUYING ADVICE:

Any criticism of iTunes' shortcomings must be tempered by the fact that it's a very intuitive, very capable, very cool program that costs not a single cent. If you have a Power Mac G3 or later—and you aren't overly concerned about iTunes disabling Toast—download a copy of iTunes 1.1 immediately. You'll be glad you did.

Are the best things in life free? With the release of iTunes—a polished, easy-to-use, *free* application for playing and encoding music—Apple would like you to believe so. And the company isn't far wrong. Although iTunes 1.1 doesn't offer some of the advanced features found in Casady & Greene's $40 SoundJam MP Plus (♦♦♦♦½; www.macworld.com/2000/11/17/reviews/soundjam.html), it's bound to enthrall all but the most demanding Mac users.

MP3 and More

iTunes mimics many of the best features of SoundJam MP Plus, letting you import songs from audio CDs, turn audio tracks into MP3 files, organize your audio files into playlists, play Internet radio broadcasts on your Mac, and transfer MP3 files between your Mac and stand-alone MP3 players. Like SoundJam MP Plus, iTunes supports variable bit-rate recording for better sound and lets you encode MP3 files at a wide range of bit rates (between 8 and 320 Kbps).

These capabilities alone earn the program our high regard. But we are also impressed by iTunes' integration with Apple's Disc Burner, a utility that lets you create CDs on supported CD-RW burners directly from within iTunes. In addition to allowing you to create CDs on the latest Power Mac G4 and iMac models, iTunes 1.1 supports CD writing on 25 third-party CD-RW drives.

Not Quite SoundJam

Alas, iTunes is also missing some of SoundJam MP Plus's finer features. iTunes has a single, brushed-metal skin; SoundJam MP includes several skins and lets you add more. iTunes' window features swirling patterns that react to a song's dynamic changes, but unlike SoundJam MP, the program includes no additional visual plug-ins. If you want to import audio from a source other than the Mac's CD drive—from an LP or cassette, via the Mac's audio-in port, for example—you'll be disappointed by the lack of anything resembling SoundJam MP's Record From Sound Input command. And unlike SoundJam MP, iTunes won't let you broadcast your audio files to the rest of the world via the Internet. Finally, some extensions installed by iTunes may keep third-party CD-burning applications from functioning properly.—CHRISTOPHER BREEN

Tune In to iTunes Besides encoding and playing MP3 files, iTunes lets you listen to Internet radio broadcasts.

Amorphium Pro 1.1

3-D–Sculpting and –Painting Program Grows Up

Electric Image's Amorphium made 3-D modeling more accessible by putting intuitive sculpting tools into a simple interface inspired by image-software wizard Kai Krause (*Reviews*, August 1999). But artists soon found limitations in the inexpensive, entry-level program. Amorphium Pro 1.1 isn't so much an upgrade as a new, professionally oriented production tool built on the features of the original. And with its ability to produce Flash animations, it will appeal to Web designers looking to add 3-D elements to their sites.

Virtual Clay

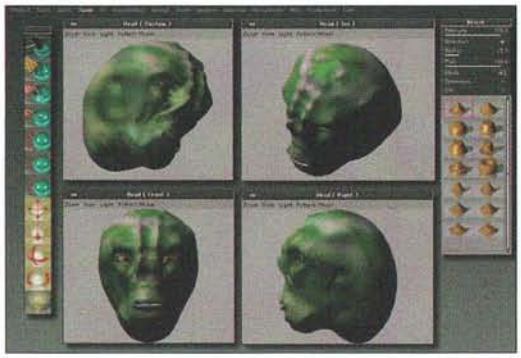
Like Amorphium, Amorphium Pro lets you modify objects as though they were made of clay, apply sculpting and painting tools, and employ real-time distortion effects. But the new version removes the original's most frustrating limitations. A full keyframe-animation timeline lets you animate multiple objects, the camera, lights, and environmental effects. The vastly improved Materials function lets you define surface colors and properties, and you can add surface effects with shaders.

In addition to importing models in popular 3-D formats, the program can import EPS files and convert them into 3-D objects. And Amorphium Pro's extensive Flash export options let you choose between realistic, high-bandwidth animations and more-cartoonish ones that consume less space.

Sculpting Tools

Basic sculpting functions are now split between two modes. Tools mode has a new Brush Editor for creating your own sculpting tools; FX mode now has a Cogs effect that lets you produce gear-like objects. A new Wax mode, complete with a Heat setting, lets you expand or contract a model's geometry as if it were a lump of wax. As before, you can use linked spheres to create fingers and other objects. With a new parenting function, you can link one object's motion to another's, and Boolean functions let you create new objects by intersecting existing ones. With the improved masking tools, you can reduce or expand polygon density in different parts of a model.

The manual is skimpy and poorly indexed, and at $379, Amorphium Pro costs more than twice as much as the original. But with all the newly added features, the program is a decent value.—STEPHEN BEALE



Never Say Kai Pros will appreciate Amorphium Pro's new interface, which includes a useful Quad View.

AMORPHIUM PRO 1.1

Rating: ♦♦♦♦

Pros: Unique modeling tools; easy to use.

Cons: Skimpy manual.

Company's estimated price: $199

Company: Electric Image, *800/736-3371*, **www.amorphium.com**

MACWORLD'S BUYING ADVICE:

Amorphium Pro vastly expands on Amorphium's feature set and remains remarkably easy to use. It's a great tool for Flash developers, 2-D artists with an interest in 3-D, and 3-D artists looking for a new organic-modeling program.

Mac Publisher Pro 1.5

Inexpensive Page-Layout Program Is Profoundly Flawed

MAC PUBLISHER PRO 1.5

Rating: ♦♦

Pros: Text-warping tool; can put text on a path.

Cons: Inability to import popular text and graphics formats; amateurish templates; can be unstable.

Company's estimated price: $40

Company: MacSoft, 800/229-2714, **www.wizardworks.com/macsoft**

MACWORLD'S BUYING ADVICE:

You could probably design a basic flyer using Mac Publisher Pro, but with no decent templates, you'd have to work hard to make it attractive—and that's assuming you could get past the bugs, import limitations, and clunky interface. Aspiring desktop publishers on a budget should look elsewhere.

Designers, ad agencies, and professional publishers have three capable—if costly—Macintosh page-layout programs to choose from. But what if you simply want to design a newsletter, flyer, or party invitation? Compared with Windows offerings, low-cost consumer-level page-layout programs for the Mac are scarce. MacSoft attempts to fill the void with Mac Publisher Pro 1.5, a $40 program targeting home users. Unfortunately, the program has little more than a handful of fun and intriguing features to recommend it.

The Good News

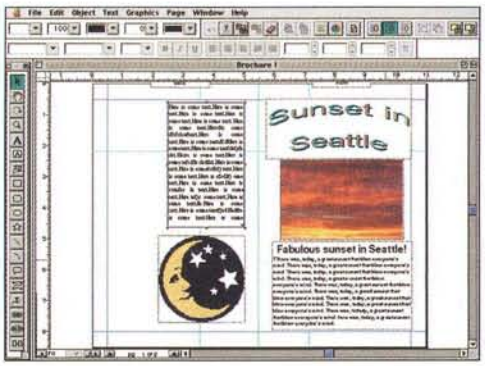
It's obvious that Mac Publisher Pro's developers copied QuarkXPress and Adobe PageMaker and then added a few features that consumers may find useful, such as tools for text warping and for placing cartoonlike text balloons in images. A curve-drawing tool makes Bézier-like lines in a simple and somewhat intuitive way, and you can even place text along the curves.

However, the program's limitations overshadow its strengths. Most critical, it can't import text from any word processing program (including Microsoft Word), and I ran into numerous bugs when importing graphics in anything other than PICT format. Unless your documents are extremely simple, you'll find these restrictions infuriating. In addition, the text-warping and text-on-a-path features work only with TrueType fonts. And you can draw curves, rectangles, and ovals, but you can't make them transparent.

Templates of Doom

One of the most important features of a consumer page-layout program is its set of templates. Mac Publisher Pro's templates aren't just bad; they're terrible. There are no wizards to help you build pages, and the ill-conceived designs are amateurish. But you won't get much help from MacSoft's tech-support staff, who seem unfamiliar with the program.

Although Mac Publisher Pro is barely usable in its current form, it does include text wraparound, basic style sheets, master pages, and text-box linking (along with less-relevant but interesting features such as a rhyming thesaurus). Let's hope the next version builds on this foundation and fixes the dire shortcomings; in the meantime, the $79 Corel Print House 2000 is a reasonable alternative (♦♦♦; *Reviews*, March 2000).—DAVID BLATNER



Melting Pot Mac Publisher Pro's interface is a flawed but fascinating combination of QuarkXPress, Adobe PageMaker, and Microsoft Word.

MovieWorks Deluxe 5.0

Inexpensive Bundle Brings Multimedia Authoring to Consumers

Want to test the waters of multimedia authoring? Check out Interactive Solutions' MovieWorks Deluxe 5.0, a suite of five integrated programs that handle all aspects of the multimedia-development process. None of the five break new ground—indeed, some are significantly limited compared with costlier programs. But together they are a multimedia-authoring system that's affordable, capable, and particularly well suited to home and school environments.

The Somewhat Fab Five

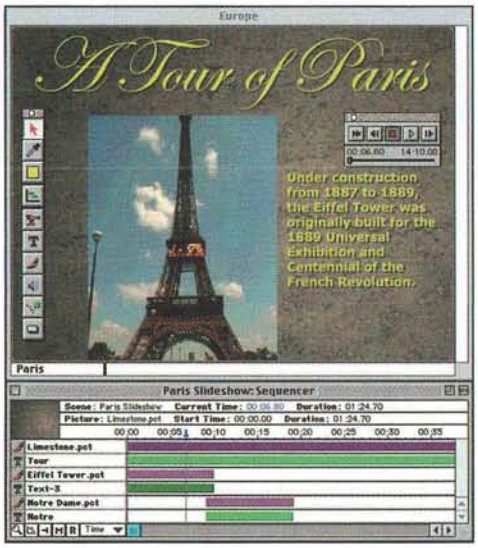
MovieWorks Deluxe's components include Paint, for image editing; Animator, for creating simple, flipbook-style animations; Sound, for recording and editing audio; and Video, for capturing analog video or DV. You combine media and add clickable buttons and text using a fifth program called, confusingly, MovieWorks Deluxe. (Interactive Solutions sells a basic version of MovieWorks, without interactive authoring features or support for Apple's QuickTime VR, for $80.)

Each program works like its counterpart in the major leagues, but with far fewer features: Paint has a passing resemblance to Adobe Photoshop, for example, but can't export images in a variety of formats. And Paint and Sound open documents entirely in RAM, limiting the size of images and sounds you can work with.

Getting Interactive

Still, these programs are ideal for learning basic content-creation techniques. You create screen designs by positioning media elements and adding backgrounds, text, and buttons. You can control when elements appear and add transitions, and a slick autosequencing feature makes short work of creating simple slide shows.

To build interactive projects, you create multiple *scenes* and then create buttons that take you to specific scenes when clicked on. An individual scene can be exported as a QuickTime movie playable on Mac or Windows computers. You distribute an interactive project as a special *player* document accompanied by a player application included in the suite. The MovieWorks Deluxe bundle includes Mac and Windows versions.—JIM HEID



MovieWorks at Work MovieWorks Deluxe lets you arrange media elements on a timeline.

MOVIEWORKS DELUXE 5.0

Rating: ♦♦♦

Pros: Excellent QuickTime support; autosequencing feature; inexpensive.

Cons: RAM-based design limits reach of Paint and Sound applications; poor documentation.

Company's estimated price: $130

Company: Interactive Solutions, *800/668-4353*, **www.movieworks.com**

MACWORLD'S BUYING ADVICE:

MovieWorks Deluxe 5.0's interface is rough at times—its developers should take a close look at the usability magic Apple has wrought in iMovie. And the product's documentation, a set of tersely written Adobe Acrobat PDF files, is weak. But there isn't a comparable set of programs available for the price. For entry-level content creation and authoring, MovieWorks Deluxe is a good choice.

ZBrush 1.1

Revolutionary Program Combines Painting with 3-D

ZBRUSH 1.1

Rating: ♦♦♦♦

Pros: Unique combination of 2-D– and 3-D–painting tools; excellent performance.

Cons: Nonstandard interface; approach to painting can be hard to learn.

Company's estimated price: $292

Company: Pixologic, *888/748-5967*, **www.pixologic.com**

MACWORLD'S BUYING ADVICE:

With its distinctive and powerful 3-D–painting tools, ZBrush 1.1 yields complex, sophisticated results. Although the program is so novel that you have to use it for a while to understand its workings, the payoff is the ability to quickly create elaborate 3-D images.

No matter how much graphics experience you have, odds are you've never seen anything quite like ZBrush 1.1. Part 3-D modeler and renderer, part paint program, this unique application lets you easily create complex images with sophisticated color and lighting effects. Paint programs normally work in two dimensions, treating each pixel as a point on a 2-D grid. But ZBrush stores a *z* dimension that contains depth data for each pixel, along with texture information. The program lets you quickly compose intricate paintings with depth, texture, and shading, though learning to use it may take some time.

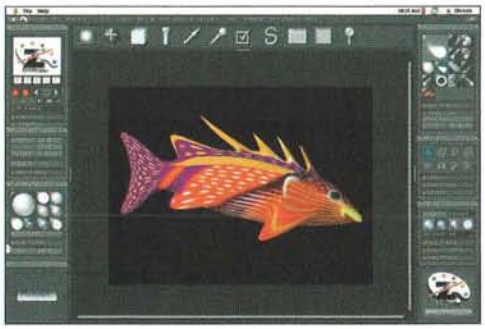
Digital Quarry

ZBrush forgoes the Mac's menu bar and windows in favor of a custom interface: a drawing window surrounded by movable, collapsible palettes. There's nothing *wrong* with ZBrush's interface, but because it's so wildly unusual, you may not be comfortable navigating the program's features for some time. And many of the tools are context-sensitive, so it can be difficult to remember how to get to a particular tool or option.

Fortunately, you don't have to know anything about splines, extrusions, or lathes to use ZBrush's 3-D tools. To begin, you simply draw a 3-D primitive; then you use brushes to push and pull on its surface and sculpt it into the desired shape. At any time, you can specify or change the color and texture of your 3-D object or rotate, scale, and move it. ZBrush's performance is stunningly fast, even at the highest rendering quality.

The Key of Z

ZBrush is more than a digital-sculpting program; its huge assortment of brushes lets you use complex geometries and textures. Because the brushes apply pixels in 3-D space, they can create and interact with any 3-D geometry in your scene. For example, when you start painting, you see a thick glob of 3-D paint. Continue painting the same area, and the glob will get deeper and deeper as the strokes are layered on. As the paint becomes thicker, it interacts with the lighting in your scene, and highlights and shadows appear as ZBrush automatically calculates lighting and texture detail in real time. If your scene contains any 3-D objects, the brushes follow their contour and geometry.—BEN LONG



Something Fishy ZBrush 1.1 lets you create 3-D–like renderings, complete with textures and lighting, using nothing more than paint brushes.

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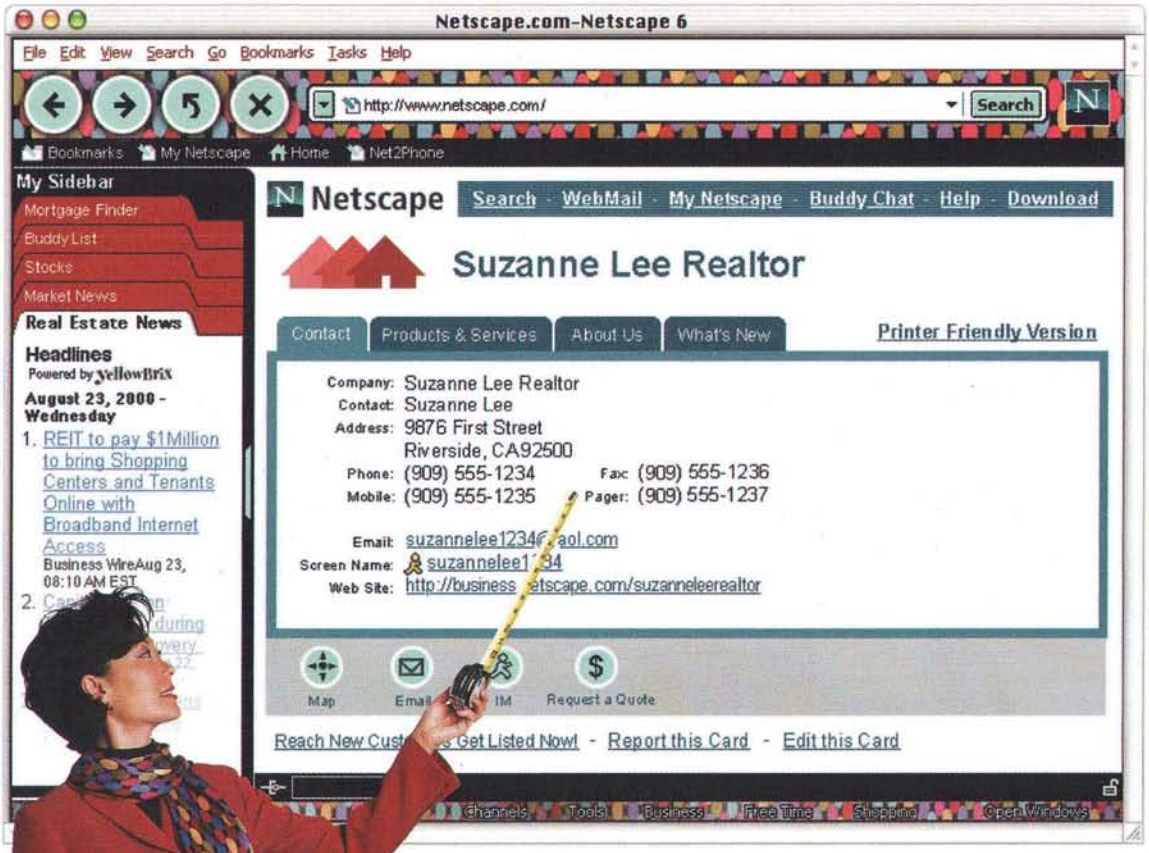

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PHOTO EDITOR FOR THE MASSES HITS BULL'S-EYE

PhotoImpression 3.0

Rating: ♦♦♦½

Pros: Easy to use; flexible layers; multiple undos.

Cons: Requires at least 38MB of RAM.

Company's estimated price: $50

Company: ArcSoft, *800/762-8657*, **www.arcsoft.com**

Macworld's Buying Advice: ArcSoft's entry-level image editor strikes the perfect balance between ease of use and room to grow. If Adobe Photoshop's highly technical approach to image editing seems like overkill to you, PhotoImpression 3.0 is a splendid, inexpensive alternative. But it's even better repackaged under the name Canon Photo Advanced Edition (see our review at www.macworld.com/2000/10/30/reviews/image.html—the resampling bug described in the review has since been fixed). Canon's version includes several fun applications and costs $10 less.

ArcSoft bills PhotoImpression 3.0 as "the photo-editing program for everyone." While Adobe Photoshop power users won't rush to dump their application of choice, PhotoImpression may well be the photo-editing program for everyone *else*.

This entry-level image editor lets you add text, retouch photos using an arsenal of powerful but unintimidating tools, and choose from among 25 special effects to enhance your images. Best of all, PhotoImpression's multiple undos and Photoshop-like layers give you enormous flexibility as you work.

ArcSoft packs a lot of fun extras into PhotoImpression—you can choose from an assortment of frames to finish off your images, and you can turn images into printable calendars and greeting cards. The PhotoFantasies feature shows you how the subject of your photo would look as a rock star or a prima ballerina. And a built-in link to PhotoIsland, ArcSoft's free photo-sharing Web site, lets you share your masterpiece with the world.—GALEN FOTT

About Face Though decidedly un-Mac-like, PhotoImpression's interface is well organized.

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Cubase VST/32

Musicians entering the world of Mac-based music production face plenty of challenges, including the daunting task of choosing from a group of very capable sequencer and digital-audio software packages. The Cubase VST/32, from Steinberg, doesn't make that choice any easier, offering all the features you would expect from a modern audio-recording and -production package: graphic, list, and score editing; EQ and plug-in effects; and support for numerous MIDI and audio tracks. New to the program are support for high-resolution 32-bit audio files, improved VST effects, and a TrueTape process that adds analog warmth to your audio tracks. The program also adds an important new VST instrument—the Universal Sound module, a software-based General MIDI synthesizer that allows Cubase users who collaborate online to hear the same set of sounds in their sequences. Although you can comfortably play the module "live," there was a tiny delay between the time I struck a key and the time it sounded on my 400MHz Power Mac G4.—CHRISTOPHER BREEN

The Sound of One Mac Clapping Cubase VST/32's virtual instruments include an analog synthesizer, sampled bass, a drum machine, and a General MIDI module.

Rating: ♦♦♦♦

Pros: Supports 32-bit audio files; better effects; includes software synthesizer; great collaboration tools.

Cons: Latency in Universal Sound module; no printed documentation.

Company's estimated price: $799

Company: Steinberg, *818/678-5100*, **www.steinberg.net**

Macworld's Buying Advice: Cubase VST/32 is a powerful and flexible audio-recording and -production tool with great online-collaboration features, but competitors such as Mark of the Unicorn's Digital Performer and Emagic's Logic Audio are equally strong. Try the Cubase VST 5.0 demo on Steinberg's site to see if Cubase suits your way of working.

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FIREWALL-LOG ANALYZER WATCHES YOUR BACK

Who's There Firewall Advisor 1.0

Rating: ♦♦♦♦

Pros: Excellent online help; categorizes log entries by severity; "whois" lookup and warning.

Cons: Requires either Open Door's DoorStop or Symantec's Norton Personal Firewall.

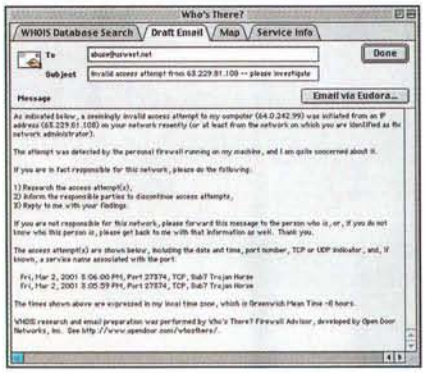
Company's estimated price: $39, single user; $149, five users

Company: Open Door Networks, *541/488-4127*, **www.opendoor.com**

Macworld's Buying Advice: If you're a home DSL or cable-modem user, Who's There Firewall Advisor is an invaluable tool for following through on intrusion attempts—as long as you're running one of the two firewalls it supports. Let's hope Open Door adds support for other firewalls in the near future.

The first thing most users notice after installing a firewall is the amazing number of intrusion attempts it reports. Open Door Networks' Who's There Firewall Advisor 1.0 cuts through the confusing multitude of firewall alerts to reveal important events, improving security by identifying hackers and reporting them to their ISPs.

To use Firewall Advisor, you need to have either Open Door's DoorStop or Symantec's Norton Personal Firewall. When you launch Firewall Advisor, it reads, analyzes, and displays the firewall's log, translating access attempts into plain English and categorizing them as high, medium, or low risk. (You can't open multiple listing windows, though, so reviewing more than one event at a time is cumbersome.) When you want to report an intrusion attempt, Firewall Advisor performs an Internet "whois" search, displays the source of the attack on a map, and e-mails the ISP in question to help it catch the hackers.—MEL BECKMAN



Tattletale Who's There Firewall Advisor finds an intruder's ISP and generates a warning letter.

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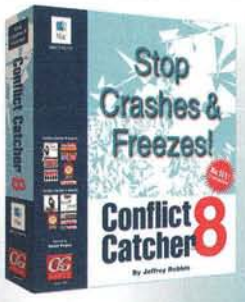

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DoubleTalk 1.0

Rating: ♦♦½

Pros: Clean, familiar interface.

Cons: Doesn't work with Network Browser; requires that AppleTalk be on; printing problems.

Company's estimated price: $99

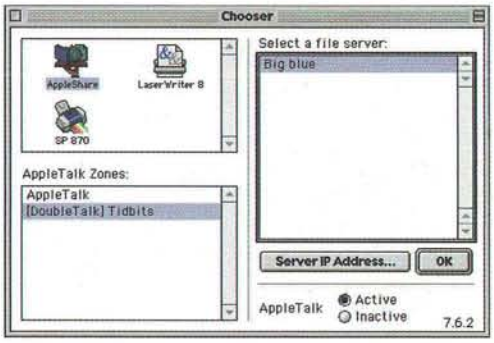
Company: Connectix, *800/950-5880*, **www.connectix.com**

Macworld's Buying Advice: DoubleTalk 1.0 does a good job of letting Mac users access shared folders on Windows PCs, but the more mature Dave, from Thursby Software, is a better choice.

Macs can coexist with PCs on Ethernet networks, but without special software, they won't understand what those PCs are saying. Thursby Software's $149 Dave (♦♦♦♦½; "Your PC Passport," August 2000) was the first to solve this problem; like Dave, Connectix's new DoubleTalk 1.0 allows Mac users to access shared folders and PostScript printers on networked Windows PCs. Although DoubleTalk has a simpler interface and lower price, it can't match Dave for overall reliability and functionality, especially since Thursby's offering also lets your Mac share its folders and printers with the PCs on the network. Both products are useful if you want to include a Mac in a mostly PC network and the administrator is ignorant of Mac networking.

DoubleTalk's interface mimics the AppleTalk and TCP/IP control panels, and the program merges almost seamlessly into the Chooser, making it easy to switch between user modes, create multiple configurations, and connect to shared folders and (at least theoretically) printers. We had no problems locating and connecting to shared folders, copying Mac files to and from a Windows machine, and playing MP3s from the PC using iTunes. Unfortunately, when connecting to a PC running Windows 98, we either couldn't see shared printers on the network or, if the printers did show up, couldn't print to them. (We experienced no problems when we connected to a PC running Windows NT 4.0.) And aliases to shared folders don't work with every Windows network setup.

DoubleTalk's integration into Mac OS sometimes feels forced—to mount a Windows shared folder in the Chooser, for example, you must click on the AppleShare icon and select a DoubleTalk entry in the AppleTalk Zones box (even though the PC isn't running AppleShare, and DoubleTalk doesn't communicate using AppleTalk). Networking neophytes may appreciate such integration, but those familiar with networking concepts may find it confusing.—ADAM C. ENGST



DoubleTalk in the Chooser DoubleTalk makes itself at home in the Chooser, so users can access shared folders via the familiar AppleShare and LaserWriter icons; however, the added step of selecting the DoubleTalk item in the Zones box eliminates some of the program's familiarity.

SOFTWARE UPDATES

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Adobe Photoshop 6.0.1
Fixes scratch-deletion bug

Adobe Premiere 6
Improves 16:9 DV editing

Aladdin StuffIt Expander 6.0.1
File-expansion tool for OS X

Apple Mail Import Script 1.0.5
Imports e-mail to OS X mail client

Apple iMovie 2.1
OS X version

AppleWorks 6.1
OS X version

DragThing 4.0
Launcher palette for OS X

Eudora 5.1b9
Beta OS X e-mail client

Fetch 4.0b7
Beta FTP client for OS 9 or OS X

Fire.app 0.23.a
OS X instant-messenger client

Griffin iMate 2.6
Update to ADB-to-USB adapter

HP LaserJet 1.0
OS X printer driver

Klondike 7.7
Solitaire games add OS X support

LimeWire 1.3
Faster Gnutella client for OS 9

Mactella 1.0.5
Beta OS 9 Gnutella client

Markzware FlightCheck 3.9r8
Bug fix for OS 9 preflight application

Mozilla 0.8.1
Beta browser for OS 9

MySQL 3.23.36
Fixes bugs in OS X Server database

NewTek LightWave 3D 6.5b
Beta OS X 3-D–animation software

OmniWeb 4.0cf3
Bug fix for OS X Web browser

Rio 800 1.55
Firmware update for MP3 player

Tex-Edit Plus 4.1.2b2
Beta OS X version

Thursby Dave 2.5.2
Adds Keychain support

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Macworld. Get It Right.

3-D–Animation Tool Adds Bones, Blurs

Poser Pro Pack

Rating: ♦♦♦½

Pros: Multiple views speed animation design; supports blurs and scripting.

Cons: Flash export not optimized.

Company's estimated price: $149

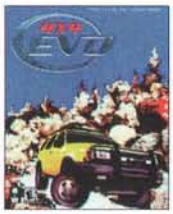
Company: Curious Labs, *831/462-8901*, **www.curiouslabs.com**

Macworld's Buying Advice: If you're a die-hard Poser 4 user, you should find Poser Pro Pack a useful addition, particularly for complex animations. If you're buying it for the Flash export feature, though, you may be disappointed.

Want to get the most out of Poser 4? Curious Labs' Poser Pro Pack adds a bevy of new functions to the 3-D–animation program, including multiple simultaneous views of scenes, for better 3-D positioning; motion blurs that help you create realistic-looking animations; and batch animation. Pro Pack includes a plug-in that makes it easier and faster to use Poser models in NewTek LightWave animations. It also has a new Setup Room, where you can attach inverse kinematic bone geometries to figures and fine-tune them more precisely than you can in Poser 4. But the new Flash export feature produces unoptimized files with far too many artifacts, and it doesn't export color transitions to Flash's gradient-blend fills.—DARREL PLANT

OFF-ROAD RACING GAME HITS THE MARK

4x4 Evo 1.0



Rating: ♦♦♦♦

Pros: Stunning graphics; Internet and network play.

Cons: Limited driver's view; no damage modeling.

Company's estimated price: $40

Company: Gathering of Developers, *410/933-9191*, **www.godgames.com**

Macworld's Buying Advice: If you and your Mac are up to the challenge—4×4 Evo requires a G3 processor and a 4MB 3-D card—fire up your engine, and revel in your road rage.

Feel the need for speed? 4×4 Evo 1.0 puts you behind the wheel of a hot truck or SUV, ready to do battle on any of 15 courses. You can head straight for the track, or you can enter Career mode and earn cash that buys performance upgrades for your vehicle. 4×4's graphics are stunning—spinning tires kick up loose gravel, sheet metal and windows reflect the sky, and birds and airplanes soar overhead. You can even compete over the Internet against other drivers using the Mac, PC, or Sega Dreamcast version of the game. My only complaints are 4×4's lack of damage modeling—hit a tree at 65 mph, and you drive off without a dent—and the driver's view, which doesn't show the dashboard or hood.—FRANKLIN N. TESSLER

ONLINE REVIEWS

Macworld.com

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www.macworld.com/2001/06/reviews/online.html

LINK

Laser printers
- ♦♦♦♦ GCC Elite 21N
- ♦♦♦½ HP 4100n
- ♦♦♦♦ Lexmark T614n
- ♦♦♦ Minolta QMS PagePro 4100GN

Digital camera
- ♦♦½ Sony Mavica MVC-CD1000

Monitor calibrators
- ♦♦♦½ ColorVision Monitor Spyder with OptiCal 3.1
- ♦♦♦½ Monaco Sensor with Monaco View 2.6
- ♦♦♦♦ X-Rite Monitor Optimizer with ColorShop 2.6

FireWire Web cams
- ♦♦½ ADS Technologies Pyro 1394
- ♦♦♦♦ Orange Micro iBot Pro

Game
- ♦♦♦♦½ Star Trek Voyager: Elite Force

UPSs
- ♦½ Belkin Components Regulator Pro Gold Series USB-Mac Version
- ♦♦♦ MGE Pulsar Ellipse 500 USB

Flowcharting software
- ♦♦♦♦ ConceptDraw 1.5

10× zoom cameras
- ♦♦♦½ Canon Powershot Pro90 IS
- ♦♦♦½ Olympus E-100 RS

Database-authoring tool for handhelds
- ♦♦½ HanDBase

MP3 player and encoder
- ♦♦♦♦ Audion 2.1

Home-automation software
- ♦♦♦♦ XTension 3.2

Cross-platform database
- ♦♦♦♦ Omnis Studio 3.0

System utility
- ♦♦♦ CopyPaste 4.4

Sound-creation tool
- ♦♦♦ Kinky Beep 2.0

Web security utilities
- ♦♦♦ iClean 3.5
- ♦♦♦½ MacWasher 2.1

Reviews You Can Trust

RATINGS

OUTSTANDING:	♦♦♦♦♦
VERY GOOD:	♦♦♦♦
GOOD:	♦♦♦
FLAWED:	♦♦
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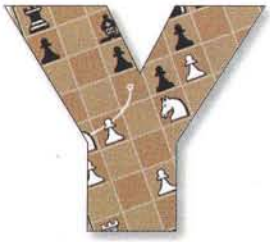
PETER COHEN

The Game Room



You may call me a heretic, but I have to admit that the Mac isn't my only gaming machine. It's true: I've also got a few console games attached to my TV—because many of my favorite games just haven't had good Mac equivalents. This has been particularly true of driving games, but the situation is changing. We'll take a look at what's available in the racing genre for the Mac.

Fasten Your Seat Belts

If movies like *Bullitt* or *The French Connection* are your thing, then you should definitely check out Driver, a recent release from MacSoft. In the game, you are an undercover cop sent to bust up crime rings by becoming the person who drives the getaway car. You must fend off other cops, other crooks, loads of slow pedestrians, and city traffic.

A frustrating game to learn, Driver is a blast once you get the hang of it. You'll power around San Francisco, Los Angeles, Miami, and New York in muscle cars, doing bad things that'll get you in trouble unless you outrun the cops and robbers. Driver's coolest feature is its Film Director mode: your inner cineast can block out shots and control the "cameras" when you replay your high-speed chases.

The game does have rough spots. It crashed my Mac once, and its installer left me with a generic application icon and a messy folder filled with configuration files.

Driver is a single-player game, but it offers many game types and enough challenge to keep things interesting. Some cities, for example, can't be visited until you've completed your missions elsewhere.

My Other Car Is a Boat

When I was a kid, I loved to play in the bathtub with plastic hydroplanes and jet boats. I suspect that the folks at French Touch Software had similar experiences, because playing WaterRace, their debut Mac game effort, is a lot like that.

You choose from a variety of characters, pick a boat, and race through your choice of exotic locations. Your goal is to win the WaterRace, an international speedboat championship. Some of the characters are comic to the point of silliness, with names such as MC Tiger and Rusty McCow.

French Touch Software developed WaterRace as a Mac application from the start. Many of the tools used to create the game are included on the WaterRace CD-ROM—a rare and generous gesture. You can use these tools to create your own courses, boats, and other elements.

WaterRace is enormous fun to play, but it can be unstable—I had to manually tweak some of the configuration settings to get them to stick. It does, however, have a great soundtrack, a decent physics model (boats slip and slide just as you would expect them to), and enough variety in boat handling and course layout to pose challenges along the way. It also supports network play, so you can round up an Internet game if the mood strikes you.

Let the Good Times Roll

Speaking of alternative modes of transportation, you might want to check out Encore Software's Kawasaki ATV PowerSports and Kawasaki Jet Ski Watercraft.

ATV PowerSports offers four different playing styles, a track editor, and other trappings that, on the surface, seem pretty cool. But although riding through sand

continues

dunes and other environments on handlebarred four-wheel contraptions is fun, ATV PowerSports just doesn't do it for me. The game's physics model is far too simplistic (getting any serious air or even knocking yourself about is pretty much impossible), the computer players are either too powerful or painfully stupid, and the sound effects become irritating.

Wanna Drag? With WaterRace, from French Touch Software, you can challenge your buddies over the Internet.

Kawasaki Jet Ski Watercraft is more fun to play. Though it's very similar to the ATV game, it has more courses, more game modes, and some differentiation in performance and handling among the various vehicles. (However, there's no multiplayer networking support in either Kawasaki game.)

Kicking Up Some Mud

If your tastes run more to mud and grit than to sand and surf, 4×4 Evo, from Gathering of Developers, is worth checking out (see *Reviews* elsewhere in this issue). It puts you behind the wheel of a light truck or sport-utility vehicle (from a real automaker) and lets you barrel through one of more than a dozen courses—from high desert to a military air base to a junkyard. Nothing comes close to 4×4 Evo's graphics or simulations when it comes to virtual driving.

Prehistoric Racing

Pangea Software scored big earlier this year when Apple chose to include Cro-Mag Rally on both the iMac and the G4 Cube. If you haven't bought a new system this year and are looking for a cart-style racing game, look no further.

Cro-Mag Rally is a good, well-rounded game. You take control of cave people as you navigate a series of racing circuits through different ages of civilization. It features a variety of cars with unique handling and performance, and power-ups, which temporarily grant you special abilities or weapons.

You can play Cro-Mag Rally over a LAN but not over the Internet. My favorite feature is split-screen multiplayer support. You and a friend can sit down at the same Mac, with two game controllers, and Cro-Mag Rally actually divides the screen between the two of you. It turns your Mac into a game console.

Crossing the Finish Line

If I had to choose only one of these to complete my Mac game collection, I'd have to go with Cro-Mag Rally. Pangea does an awesome job on the fit and finish, and the game is stupefyingly fun to play.

Each of these games brings something to the Mac driving-game experience, though: 4×4 Evo is realistic, while Driver's Film Director mode makes replays almost more fun than the action itself. And WaterRace is great if boats are your thing. You may also want to take Star Wars: Episode 1 Racer for a spin (♦♦♦½; *Reviews,* May 2000). For pure escapism, it rules.

Our choices in the driving-game arena are growing and improving, and hopefully we'll be able to keep on truckin' for years to come. **m**

Freewheelin' PETER COHEN, senior editor at MacCentral, has been pulled over one too many times and now pursues his racing impulses from behind the wheel of his Mac.

Driven to Distraction

COMPANY	GAME	MOUSE RATING	COMPANY'S ESTIMATED PRICE	CONTACT	PROS	CONS
Encore Software	Kawasaki ATV PowerSports	♦♦	$25	310/719-2890, www.encoresoftware.com	Integrated race-course editor.	No Internet or LAN play; simplistic action; lacks realism.
	Kawasaki Jet Ski Watercraft	♦♦½	$20	310/719-2890, www.encoresoftware.com	Varied course designs and race modes.	No Internet or LAN play; unimpressive graphics and simplistic action.
French Touch Software	WaterRace	♦♦♦½	$34	info@french-touch.net, www.waterrace.com	Editing tools included; varied courses and boats; realistic.	In-game characters are silly; occasional stability problems.
Gathering of Developers	4×4 Evo	♦♦♦♦	$40	410/933-9191, www.godgames.com	Stunning graphics; Internet and network play.	Limited driver's view; no damage modeling.
MacSoft	Driver	♦♦♦½	$29	800/229-2714, www.wizworks.com/macsoft	Seventies muscle-car action; fun Film Director mode.	A bit unstable; problematic installer.
Pangea Software	Cro-Mag Rally	♦♦♦♦	$40	512/266-9991, www.pangeasoft.net	Gorgeous graphics; fun and varied challenges; split-screen mode.	No Internet play.

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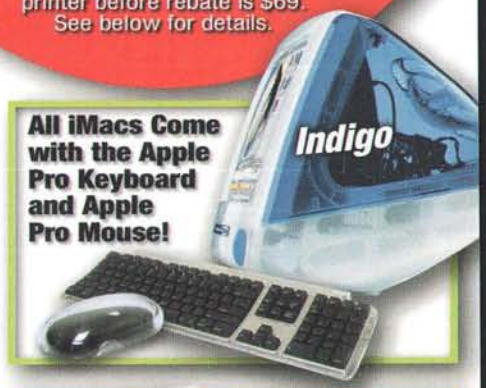

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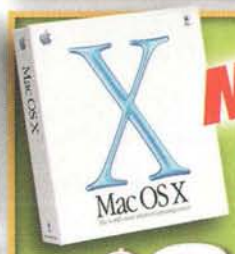

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FREE RAM	64MB
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iTunes and iMovie 2	YES

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MHz	500
RAM	64MB
FREE RAM	128MB
TOTAL RAM	192MB
Hard Drive	20GB
CD-RW	YES
56K Modem	YES
USB/FireWire Ports	2
iTunes and iMovie 2	YES

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MHz	600
RAM	128MB
FREE RAM	128MB
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Hard Drive	40GB
CD-RW	YES
56K Modem	YES
USB/FireWire Ports	2
iTunes and iMovie 2	YES

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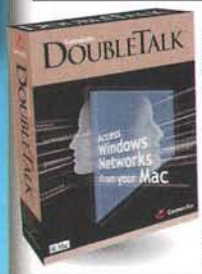

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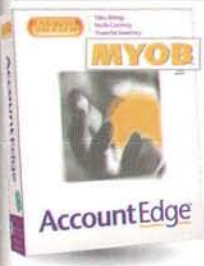

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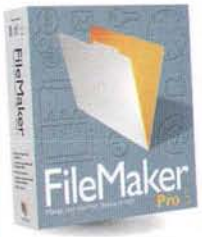

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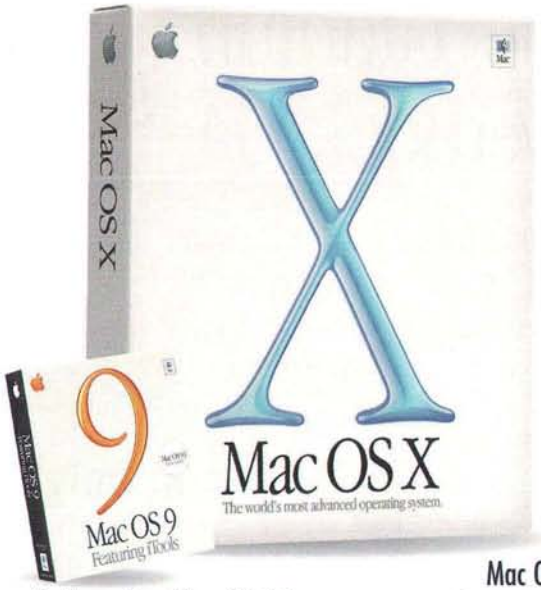

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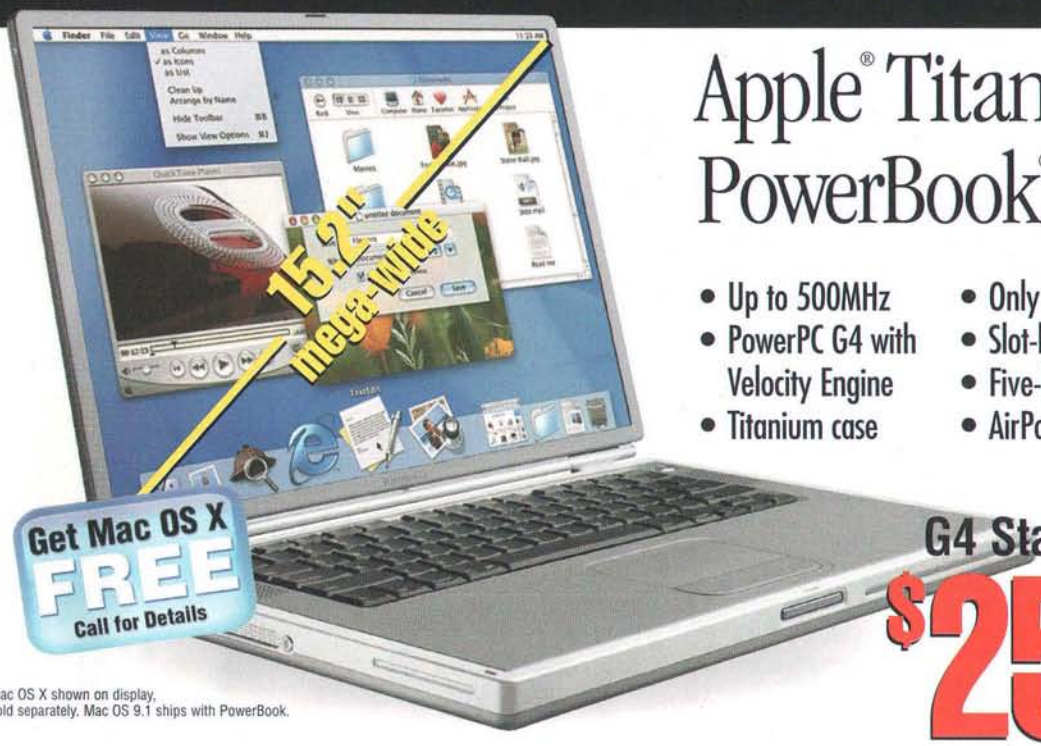

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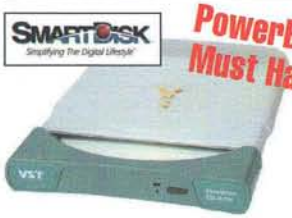

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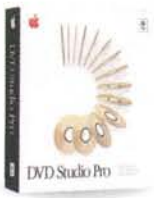

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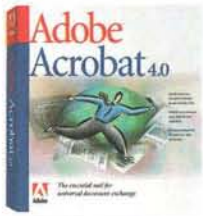

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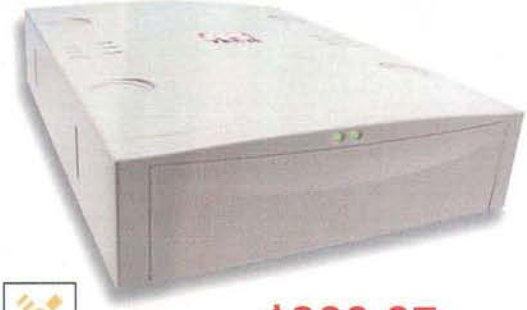

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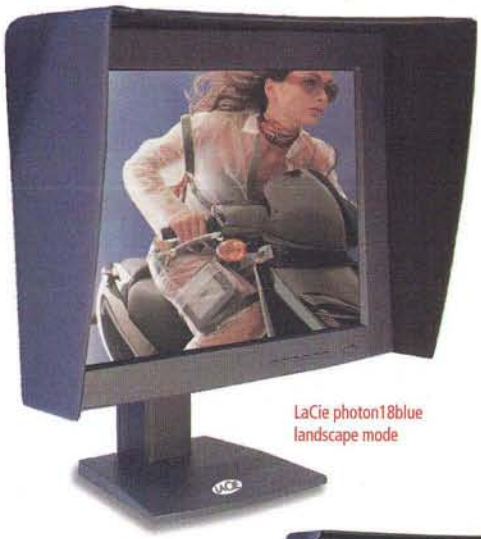

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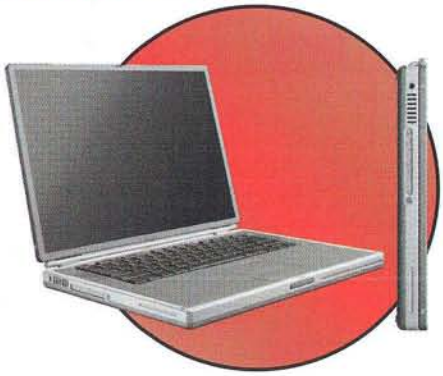

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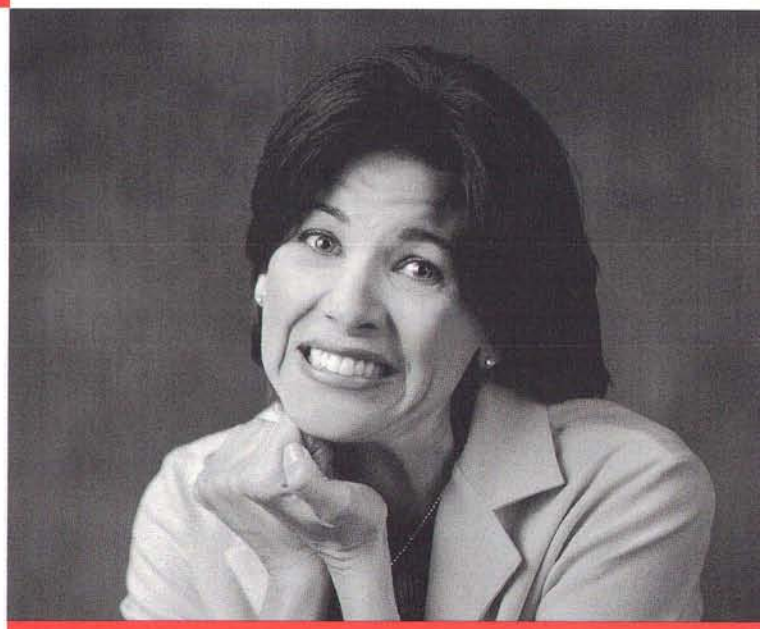

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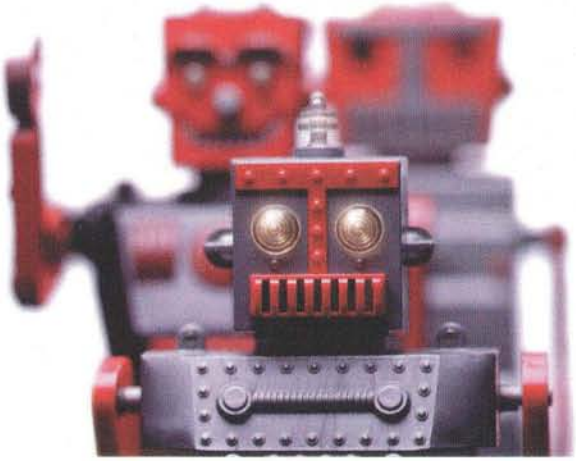

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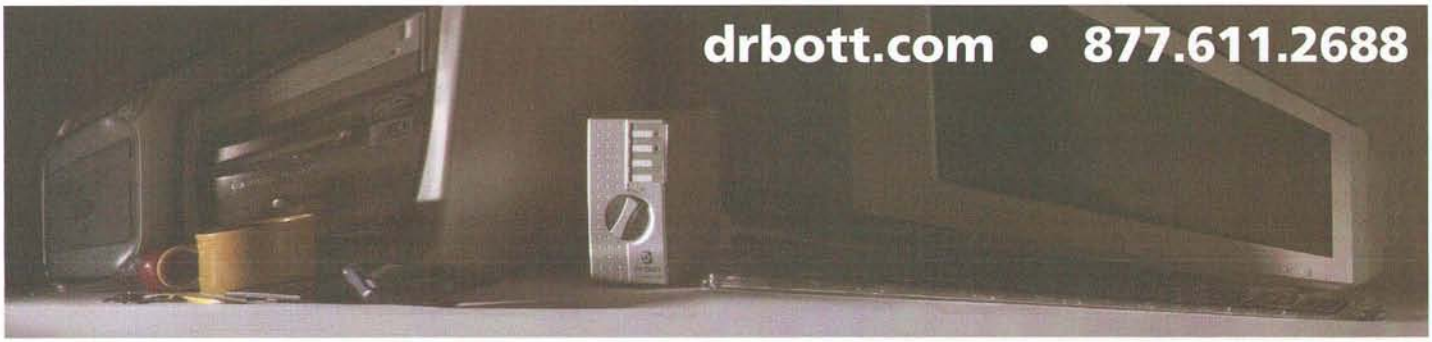

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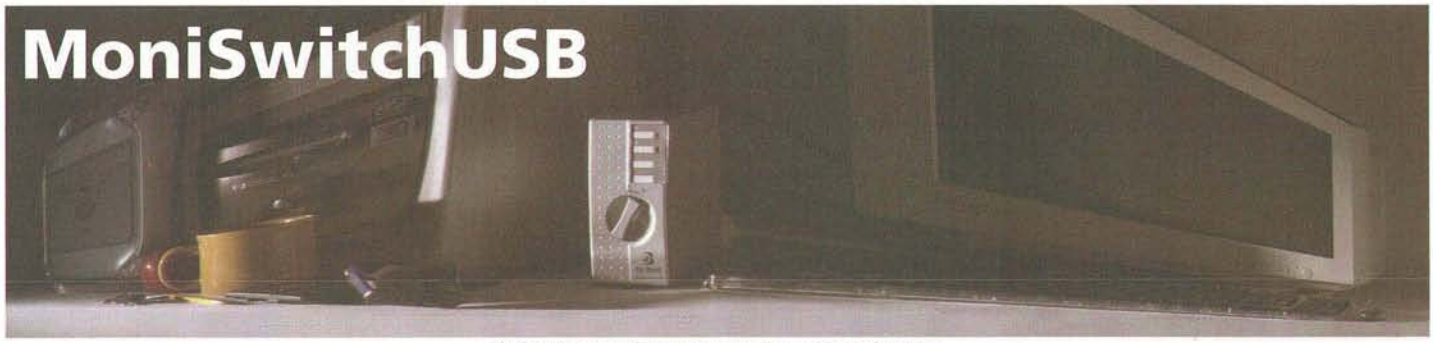

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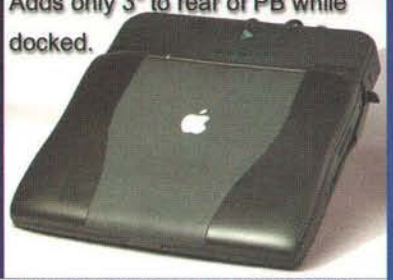

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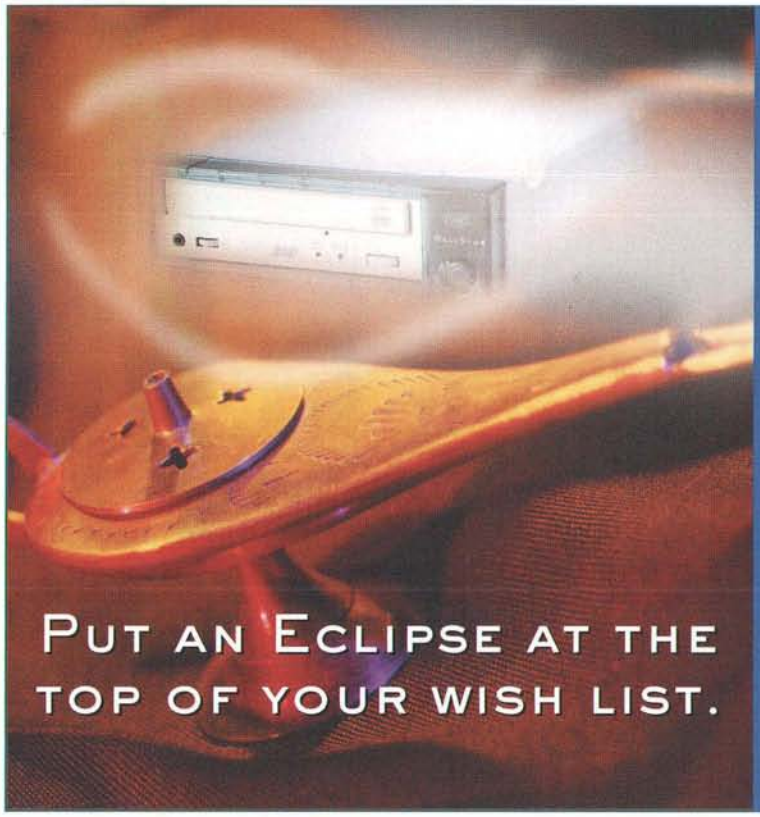

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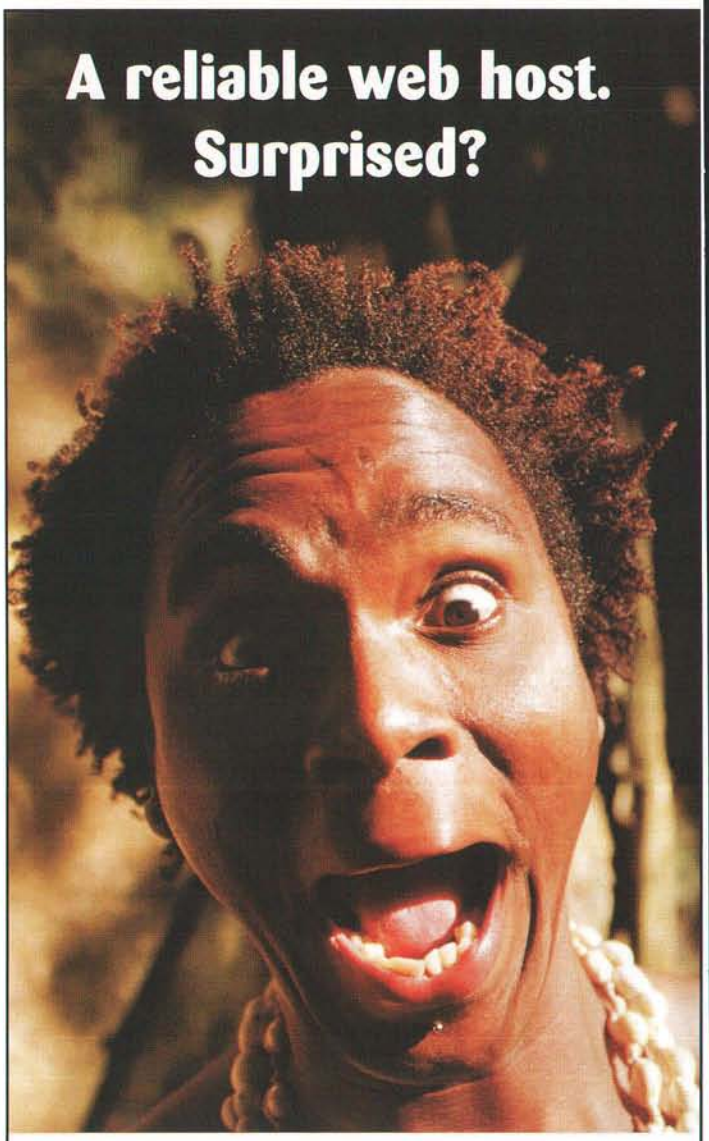

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15-year-old definition of the Macintosh experience, as Mac OS X's architects have done?

Everyone's going through the same ordeal. It's delightful and thrilling and frightening. All around me, folks are running around, looting stores, and proclaiming that the End of the Mac is nigh while helping themselves to a couple of DVD players at Best Buy. Others, thoroughly hypnotized by those pulsating buttons, have embraced Mac OS X and are making it do wonderful things that Macs can otherwise manage only in cartoons.

Knee-Jerk Rebels

When we were teenagers, we rebelled against anything and everything that registered on our radar. As we made our way into adulthood, we exploited our rebellious impulses a little more efficiently, focusing them on the issues we deemed truly important.

Eventually, though, we've all got to realize that the things it's most important to rebel against are our own hard-won principles and preconceptions—to realize that sometimes there's a difference between the Right Way and what we've merely come to *think* of as the Right Way. Our gut-level distaste for something new is less about our reaction to the thing in question than it is about our fears of abandoning the familiar and comfortable.

The computer world faced that challenge in 1984. Some of us were apoplectic with joy about the first Mac and embraced it right away, even though in many ways it was about as useful as a camel that could yodel Gershwin. Others fell in love but managed to restrain themselves until the Mac became a more practical alternative to the status quo. Still others remain unmoved.

2001 will go down as the Proving Year for Mac OS X. People will buy software for it. Apple will release updates for it. Surely, like the original Mac, Mac OS X won't be truly finished until it arrives at its equivalent of System 4.0. Until then, we won't know whether that ending will be like *1984*'s, in which our impotence against the will of the collective is proved, or like *2001*'s, in which humankind gains the ability to play among the stars.

Regardless of the outcome, 2001 will be remembered as the year in which the Mac community irrevocably grew up. And you'll see how 2001 won't be like "1984": This time, the blond woman in running shorts isn't hurling a hammer at a video image of Big Brother—she's throwing it at a mirror. **m**

ANDY IHNATKO has written for the *Chicago Sun-Times*, *Playboy*, and other publications.

ANDY IHNATKO

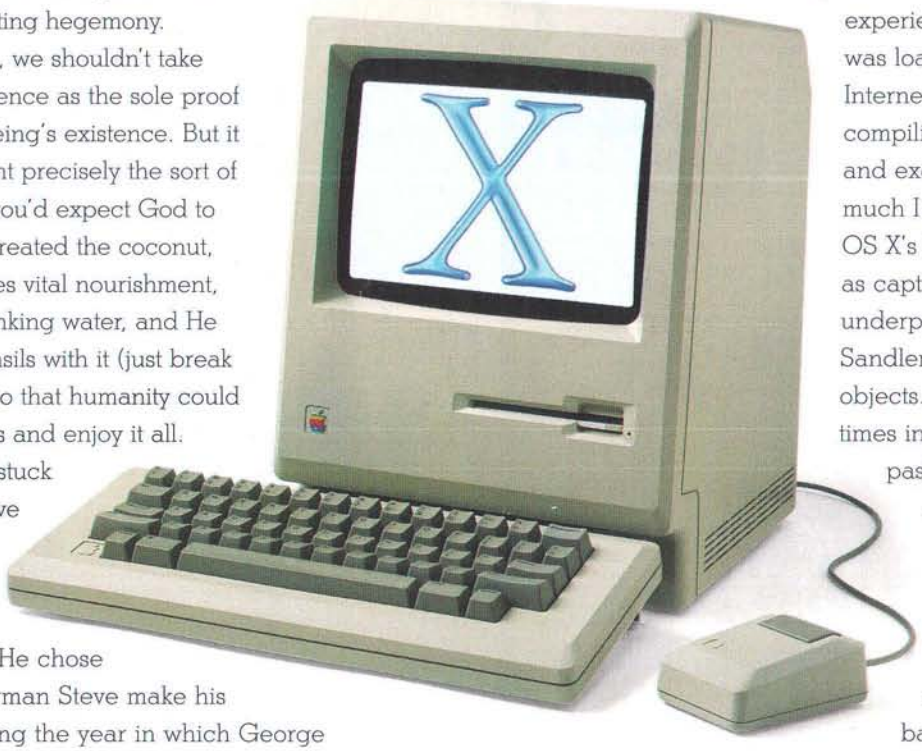
2001: A Mac OS Odyssey

WHY THIS YEAR WILL BE LIKE 1984 ALL OVER AGAIN

Let me apologize, folks. The Infinite Mystery of God's existence has caused everyone no end of bafflement and trouble for the past 3,800 years, and although I discovered the definitive answer some time ago, I haven't actually done anything with it, apart from jotting it down as a to-do item in my Palm. That was pure carelessness on my part.

In any event, yes, God does indeed exist, for better or for worse. If you're unwilling to just take my word for it, consider this: in all of world literature, only two years are also titles of classic novels: 1984 and 2001. And Steve Jobs chose *both* of those years for Apple to roll out new operating systems designed to blast apart the existing hegemony.

Of course, we shouldn't take mere coincidence as the sole proof of a Divine Being's existence. But it does represent precisely the sort of cheap irony you'd expect God to go for. God created the coconut, which provides vital nourishment, fiber, and drinking water, and He included utensils with it (just break off a piece!) so that humanity could readily access and enjoy it all. And then He stuck it 50 feet above our reach in a tree with no branches.



Similarly, He chose to have Chairman Steve make his first play during the year in which George Orwell predicted we would be struggling against a totalitarian dictatorship. And now, during the year in which Arthur C. Clarke predicted we would transcend our clumsy human forms and move to the next stage of cosmic enlightenment, Chairman Steve is back for a second act.

(The Infinite Mystery of why Steve Jobs continues to wear those black mock turtlenecks at important functions remains for the next generation of theologians to ponder, however.)

Thus Spake Jobs

Like it or not, Mac OS X is meant to have the same effect on us as Macintosh System 1.0 had on the MS-DOS world. This time, *we* are the enemy—and sure enough, Mac users' grumblings began with Apple's very first, very cautious demonstration of the Aqua interface.

The more I work with OS X, the more my attitudes and opinions—about almost every aspect of it—flip-flop. I mean, I generally like the Aqua interface, but I worry that Apple has traded elegance for flash. I like the new browser-based Finder, but dangit, it takes up a lot of room on my screen.

And while some people's first experience with Mac OS X was loading up Microsoft Internet Explorer, mine was compiling GNU source code and excitedly seeing how much I could exploit Mac OS X's Unix heritage. I'm as captivated by X's Unix underpinnings as an Adam Sandler fan is by shiny objects. And yet . . . several times in the course of the past year, I've skidded around a corner in Mac OS X and found myself transported to the dark, humid realms of lowercase backslash directories when I wasn't expecting it. It's dampened my enthusiasm for X every single time. Um, this *is* still Mac OS, right?

All of this is hot stuff. I can get a lot of cocktail-party conversation out of those comments. But (and I offer this only as a remote possibility) could I be, simply, full of it? Am I evaluating Mac OS X as a brand-new operating system? Or am I just rebelling against having to rethink my

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JOHN GREENLEIGH

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